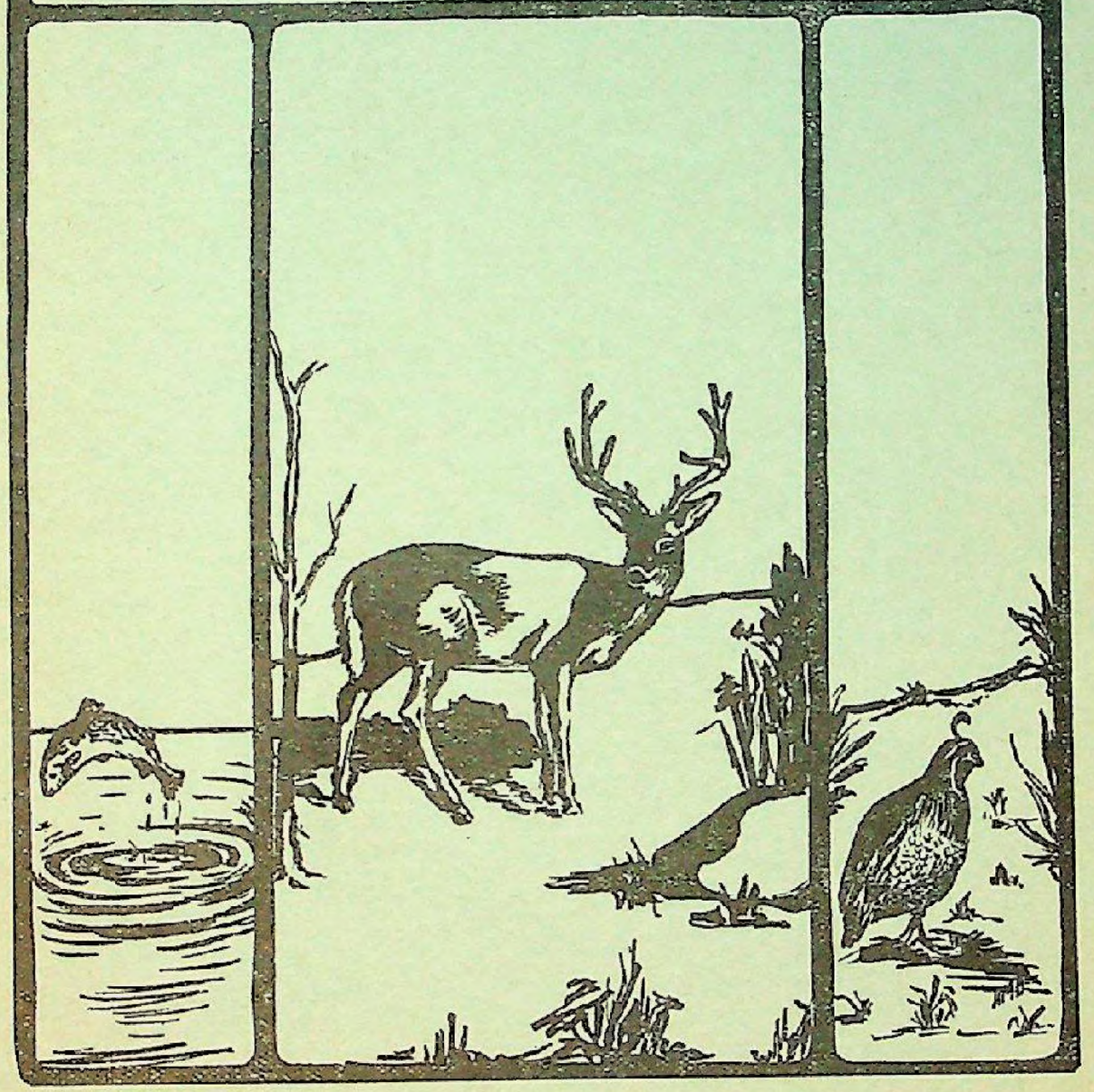
M. L. Johnson

CALIFORNIA FISH AND GAME

"CONSERVATION OF WILD LIFE THROUGH EDUCATION"

Volume 11 Sacramento, July, 1925 Number 3



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UPLAND GAME BIRDS IN THE STATE OF WASHINGTON, WITH A DISCUSSION OF SOME GENERAL PRINCIPLES OF GAME IMPORTATION.*

By WALTER P. TAYLOR.

From early times the northwest, including Washington state, has been an experimental ground of more than ordinary importance for the attempted introduction of foreign game birds. There are several reasons for this. The conspicuous success of modern methods of stocking streams with game fish, and the successful introduction of the Chinese

*Reprint from "The Murrelet" Vol. IV, No. 3, November, 1923, pp. 5-10.

pheasant by Judge O. N. Denny about the year 1881, evidently gave a persistent trend to the interests of sportsmen. In Washington, especially in recent years, these interests have been stimulated also by the fact that not only the state, but each of the thirty-nine counties, has an official agency for fish and game protection, with a game fund, and the obligation to use it in the protection and increase of game. At the end of the year each of the forty agencies must show results. What more natural than that a portion of the monies collected should be spent for the importation of a handsome and highly recommended species from overseas? Whatever the reasons may be, the records of attempted introduction, incomplete as they are, indicate an astonishing amount of activity.

The earliest note, so far as known, on the importation of a game species into Washington is that of Cooper and Suckley (Pac. Railroad Repts., Vol. XII, Bk. 2, 1860, p. 225), and pertains to the mountain quail. Suckley writes that a few of these birds had been introduced from the Willamette Valley on the prairies back of Fort Vancouver, where they were increasing rapidly. But the high tide of importations did not begin until some twenty years later, when Judge O. N. Denny, then Consul-General to Shanghai, arranged for several shipments of Chinese, golden, and silver pheasants, with other species, from China. Exclusive of the California and mountain quails, some thirteen species of upland game birds are reported to have been brought into the state, including the following: Bob-white, Gambel quail, scaled quail, Chinese quail, Hungarian partridge, bamboo partridge, sand grouse, "Chinese" pheasant, Tragopan pheasant, Reeves pheasant, golden pheasant, silver pheasant, and wild turkey. In addition to these there are references in the game laws to the bronze pheasant, copper pheasant, and Japanese pheasant, though no details concerning their importation have been forthcoming. A number of additional species of foreigners, including the Lady Amherst pheasant and the Prince of Wales pheasant, have been kept at the state game farm at Walla Walla, but so far as known, have never been liberated for stocking purposes.

In the attempt to secure scientific information on the imported species one is handicapped by the fragmentary character of the data. This inadequacy is the result partly of the large number of agencies involved, and partly of the lack of any machinery for preserving records. Participating at different times in the importation program have been not only the state game authorities, but also the game commissions of each of the thirty-nine counties, as well as various private citizens and organizations of sportsmen. While it happens thus that much of the pertinent information is lacking, the obtainable facts are worth considering.

NOTES ON CERTAIN ONES OF THE IMPORTED SPECIES.

The bob-white, *Colinus virginianus* subspecies.

Both the eastern and the Texas bob-white have at different times been introduced. Earlier writers do not mention the bob-white, the first reference to its occurrence being that of Johnson (List of Birds found in Washington Territory, in Rept. Sec. Int., Vol. II, 1884, 1885, p. 596), who lists the "American quail" as an introduced species occurring and breeding in western Washington. Most of the importations of the bob-white have probably taken place within the last thirty-five years. Dr. T. S. Palmer, expert in game conservation of the U. S. Biological Sur-

vey, writes that in the early 90's most of the quail shipped for propagation came from southern Kansas, Oklahoma, and northern Texas. About 1906 and 1907 large shipments of *C. v. virginianus* were made from Alabama and one or two of the other Gulf states. Since 1910 practically all of the stock for propagation has been the Texan subspecies, imported from northern Mexico.

The records of the former state game warden (Darwin, First and Second Ann. Repts., 1916, pp. 25, 46; Third and Fourth Ann. Repts., 1918, pp. 30, 62; Fifth and Sixth Ann. Repts., 1919, pp. 38, 77) indicate that from 1913 to 1918 no less than 5,037 bob-whites were purchased and liberated by the various county game commissioners.

The species has taken a somewhat precarious hold over the greater part of the state, fluctuating in numbers as the seasons are favorable or unfavorable. The experience of the Spokane County Game Commission with the bob-white led one former member to express the opinion that if shooting was to be enjoyed each year the species would have to be reintroduced each spring. The widely different response made by the bird to the new conditions as encountered in different parts of the state is indicated by reports from sixty Washington correspondents of the Biological Survey, including forest rangers and supervisors, sportsmen, farmers, and government hunters. Of the sixty persons sending in estimates, three believe the bob-white to be holding its own, eighteen are noncommittal, fifteen about evenly divided between the eastern and western parts of the state, report it decreasing, and twenty-four of the sixty, eighteen living in eastern Washington and six in western, think it increasing.

Summarizing its present status, we note that the bob-white now occurs as a resident in greater or lesser numbers in most of the counties of the state, apparently doing best in the upper Sonoran region of eastern Washington, and thriving also on certain islands of Puget Sound.

Mountain quail, *Oreortyx picta* subspecies.

There seems to be little evidence to support the view that this species was native in southwestern Washington. Peale (Mammalia and Ornithology, U. S. Expl. Exp., Vol. VIII, 1848, p. 183) says the Columbia River appears to be its northern limit. Reference has already been made to Cooper and Suckley's note on the introduction of the mountain quail prior to 1860. Bowles (in Dawson, The Birds of Washington, 1909, p. 564) is of the opinion that the species is not native. Whether or not it ever was indigenous, the mountain quail has been repeatedly introduced, its present geographic range having been given already. A few correspondents of the Biological Survey report the mountain quail increasing, but most of them tell of decreases ranging as high as 75 per cent in three years.

Scaled quail, *Callipepla squamata* subspecies.

The scaled quail may have been imported previous to 1913 for the game laws of that year accord it a closed season in Yakima and Kittitas counties until October 1, 1915. The state records indicate that the Yakima County Game Commission brought in and liberated 552 individuals between 1914 and 1917. In 1919 the Grays Harbor County Commission secured 118 scaled quail from Eagle Pass, Texas, introducing them into the coastal region. It is of interest to the biologist to

note that the origin and destination of this shipment have little in common environmentally. The vicinity of Eagle Pass is a lower Sonoran mesquite desert, with an annual rainfall of twenty-one inches; while Grays Harbor is a heavily forested portion of the humid transition zone, its annual rainfall being ninety inches. The implied differences in other environmental conditions will be readily appreciated.

The California quail, *Lophortyx californica* subspecies.

It seems probable that the California quail is altogether an introduced species in Washington, though its original status is not definitely known. Suckley (Pac. Railroad Repts., Vol. XII, Bk. 2, 1860, p. 226) referred to its occurrence on the prairies near Puget Sound, where it had been resident only since the spring of 1857, at which time, through the liberality of Governor Chas. H. Mason and Hugh Allen Goldsborough two lots were imported from San Francisco and liberated near Olympia. A former state game warden records 468 of these quail purchased and liberated between the years 1914 and 1918 by the county game commissions of Garfield, Walla Walla, and Yakima counties. The present known geographic range in the state has already been given. While the species is decidedly not common, it seems to be holding its own or perhaps increasing somewhat. Only four out of thirty-eight correspondents of the Biological Survey in various parts of the area inhabited by the mountain quail note a decrease in numbers; several are noncommittal, and others speak of its fluctuation according to the season; fourteen report it increasing.

Gambel quail, *Lophortyx gambelii.*

About the year 1917 the Chelan County Game Commission purchased 120 Gambel quail, liberating them in the county. Chairman Ovenden of the Commission wrote me recently that some reports of their being seen were received the first year or two after their liberation but they are seldom heard of any more.

Chinese quail, *Coturnix coturnix japonica.*

The Chinese quail was probably imported previous to 1904 as it was protected in western Washington that year. Renewed activity on the part of the state game authorities is reported in 1923. Already, according to State Supervisor of Game and Game Fish, J. Warren Kinney, some 500 individuals have been imported from northern China and liberated in Stevens, Spokane, Yakima, Garfield and Clallam counties. The species has never taken hold, so far as we can learn, in Washington or anywhere in the United States, probably largely on account of the fact that it is migratory.

European "Hungarian" partridge, *Perdix perdix.*

The Hungarian partridge has been widely introduced through the state during the last twenty years. Al Weismann of Spokane reports that about 1906 he helped raise a popular subscription in Spokane County to import the species, a few pairs being secured from dealers in Yardley, Pa. This appears to be the first introduction of the Hungarian into the state. Reports of the game warden indicate that no less than 4,794 individuals were purchased and liberated by some of

the county game commissioners in the years 1913 to 1915 inclusive. About this time the species may be said to have become established. In eastern Washington it has not only been successfully acclimated, but is reported to be increasing rapidly and spreading to considerable distances from the points of introduction. While it does not do so well west of the Cascade Mountains, on the whole its importation has been a great success, and it is to be found at moderate altitudes nearly throughout the state. It appears to have few or no bad habits, and we have heard but one report of damage, consisting of injury to growing grain in the vicinity of Loomis, Washington. It seems to be popular with farmer and sportsman alike.

Bamboo partridge, probably some species of *Bambusicola*.

Supervisor J. Warren Kinney writes that the state game department has recently liberated bamboo partridges in Stevens, Spokane, Yakima, and Garfield counties. He also states that some of the birds have been successfully raised at the new state game farm near South Tacoma.

Sand grouse, *Syrrhaptes paradoxus*.

Sand grouse are also reported to have been liberated recently in Spokane, Stevens, Yakima and Garfield counties.

Ring-necked "Chinese" pheasant, *Phasianus torquatus*.

Probably the best-known imported exotic game bird in the United States is the Chinese pheasant, the introduction of which into the northwest about the year 1881 (Merriam, Rept. of the Orn. and Mamm., for 1888, 1889, p. 485; Palmer and Oldys, Farmers' Bull. No. 197, 1904, p. 7; Shaw, The China or Denny Pheasant in Oregon, 1908, p. 12) marks an important point in the history of game conditions in that section. Some two years later a shipment of ninety birds, principally silver and copper pheasants, but including some Chinese and goldens, was made by Judge Denny, the lot being turned over to the Portland Rod and Gun Club, and some of the birds, at least, being liberated on Protection Island, Washington, where the golden and Chinese pheasants are reported to have become abundant.

The earliest published reference to the Chinese pheasant in Washington appears to be that of Johnson (Rept. Sec. Int., Vol. II, 1884, 1885, p. 596) who writes of the "Mongolian"* pheasant as an introduced species occurring and breeding in western Washington. According to Palmer and Oldys (Farmers' Bull. No. 336, 1908, p. 23), the species was already accorded a three-months open season between the years 1903 and 1907 in at least portions of the state.

Since the original importation of the species there has been continued activity in bringing in additional lots and propagating the species within the state. The records of former State Game Warden Darwin show a growth in numbers of Chinese pheasants liberated from 746 individuals in 1913 to 3,318 in 1918. Many of these birds came from the state game farm at Walla Walla, the successful establishment and operation of which is an outstanding achievement of the Washington game authorities. The location of the farm at the state penitentiary

* It is impossible to segregate the records of the different types of ringneck pheasants as imported. Probably both Chinese and English ringnecks are represented, but whether any true Mongolian have been brought in is less certain.

enabled its operators to utilize the free labor of the prisoners, the arrangement being beneficial all around. A second state game farm has more recently been established near South Tacoma. J. Warren Kinney, state supervisor of game and game fish, reports that it is planned to liberate, this year (1923), more than 10,000 Chinese pheasants from these farms, and in addition to this to distribute 30,000 eggs for hatching. The figures indicate the wholesale scale of the pheasant importing and propagating enterprise in Washington, and testify to the popularity of the bird with the sportsmen and citizens generally. In 1917 Chief Deputy Game Warden R. B. Wales estimated that 70,000 Chinese pheasants had been taken by sportsmen in Yakima County alone; J. Warren Kinney is of the opinion that 100,000 individuals were killed in 1922 in the state as a whole. The bird has evidently become successfully acclimated, though there is some question, perhaps, as to whether it could maintain itself in such large numbers under the heavy annual toll taken without continuous importation and propagation.

The "Chinese" pheasant has been introduced into every county in Washington, and in most it thrives. It does not, however, do well under extremes of moisture, cold, or snowfall, nor does it seem well-suited to the heavy woods. It is especially fond of the irrigated farming country in the upper Sonoran zone in the eastern part of the state, and it is abundant on certain islands of Puget Sound, where the rainfall is not so extreme as it is on some parts of the mainland of western Washington. It is found on cleared lands of the west side, and in suitable meadows, willow patches, stubble-fields, alfalfa fields, and along fence rows, throughout the state. It has been seen in the open bunch grass country of eastern Washington, and even on the sage brush plains, but, according to Stanley G. Jewett, never ventures far from water, nor appears at a very high altitude. It does not occur above the transition zone.

A controversy regarding the food habits of the "Chinese" pheasant began almost as soon as the species was introduced, the farmers asserting that it is altogether too fond of ranch products, the sportsmen replying that it is a wholesale destroyer of noxious insects. In different parts of Washington it has been reported to dig up growing corn, eat potatoes, and destroy gardens. It is also said to destroy the nests and young of ground birds, especially quail and ruffed grouse. Kennedy (Condor, Vol. XVI, pp. 253-255) asserts that the pheasants of the Yakima Valley have apparently increased in numbers with the increase of the alfalfa caterpillar, *Eurymus eurytheme*, which, with meadowlarks and Brewer blackbirds, they probably keep in check. In view of the widespread popularity of the pheasant, it seems unlikely that any damage done the farmers' crop is not more than made up by its consumption of harmful insects, but a careful study of food habits, including observation in the field at different seasons, and laboratory examination of stomachs, is called for.

Tragopan pheasant, *Tragopan* species.

Merriam (Rept. of the Orn. and Mamm., for 1888, 1889, p. 487) quotes Asher Tyler of Forest Grove, Oregon, to the effect that two female Tragopan pheasants were liberated on Protection Island in connection with a shipment of golden pheasants made in the early 80's. Tyler reports that he has not been able to find out what became of them.

Reeves pheasant, *Syrmatius reevesii.*

According to the records of the former state game warden the game commission of Yakima County purchased and liberated twenty Reeves pheasants during the year 1914. In 1915 the species was mentioned in the game laws. In 1917 Chief Deputy Game Warden R. B. Wales, reported the species successfully introduced in the state, and in 1919 H. F. McElhaney wrote us that a few occur in Yakima County. Our own investigations, however, give us no evidence of the presence of the species in a wild condition anywhere in the state, nor have we obtained any further information from our correspondents.

Golden pheasant, *Chrysolophus pictus.*

Small numbers of the golden pheasant have been liberated in various parts of the state at intervals since about 1883, when part of a mixed shipment of birds, sponsored by Judge Denny, was turned loose on Protection Island. We have record of less that 100 individuals introduced altogether. The high cost of the pheasants, amounting in 1904 to $18 to $24 a pair (Palmer and Oldys, Farmers' Bull. No. 197, p. 22) has precluded the adequate stocking of coverts. The golden pheasant is reported to have a tendency toward boldness. This trait, and also the large size and brilliant coloration of the bird, all militated against its survival.

Silver pheasant, *Gennaeus nycthemerus.*

An unknown number of silver pheasants were included in the Denny shipment of 1883, mentioned above under the golden pheasant. As with the latter, we have records of the importation of less than 100 birds altogether. No success appears to have attended efforts to acclimate the species.

Wild turkey, *Meleagris gallopavo* subspecies.

Six wild turkeys were imported by the game commissioners of Yakima County between June 12, 1913, and February 28, 1914, and twelve the following year, but the species did not become established.

Summarizing, we note that, exclusive of the mountain and California quails, definite attempts have been made to introduce more than thirteen species; of these, three have become established and are doing fairly well: The bob-white, the European or "Hungarian" partridge, and the ring-necked or "Chinese" pheasant.

THE PISMO CLAM CROP.*

By Wm. C. Herrington.

In accord with the program of the State Fisheries Laboratory the annual cross-sectioning of the beach at Pismo, Oceano, and Morro beaches was undertaken late in October and November, 1924. The method employed has been made possible by the results obtained from Dr. F. W. Weymouth's study of the Pismo clam, (*Tivela stultorum*), Fish Bulletin No. 7. It is now possible to determine the success of the spawning season and the mortality of each year class since 1918, and

*Contribution No. 50 from the State Fisheries Laboratory.

to obtain a better understanding of the fluctuations in abundance from year to year.

The method consists of digging a trench across the intertidal zone and enumerating the clam population found therein according to age and size. In order to compare results obtained at different levels on the beach, the trench is divided into three-meter segments, and the clams from each segment wrapped separately in squares of cheese cloth. In the 1924 work the trench was laid off by means of a quarter-inch rope marked at three-meter intervals with red yarn, and stretched from the high tide mark across the beach into the surf. The trench was dug with a clam fork, parallel to the rope and with the width equal to the spread of the fork. As the clams bury themselves in the sand to a depth about equal to their length, a trench six or eight inches deep is sufficient to locate them. The sand from the trench was run through a sieve of quarter-inch screening to insure obtaining all the small clams.

In 1924, five cross-sections were made on beaches at or near Pismo. The first section was made at Pismo on October 28th, and yielded 223 clams of all ages. The second section was made at Oceano on the 29th, but had to be abandoned before completion because of the heavy surf, which came up the night before. The third section was made on October 30th at the same location as section one, and yielded 191 clams. At the next favorable run of low tides about four weeks later, two more sections were made, one at Morro, which yielded but sixteen clams, and the other at Oceano, where 294 clams were obtained.

The feature of the collections which is probably of greatest interest to those concerned with the preservation of the Pismo clam is the success of the 1924 spawning. The season was the most successful since the summer of 1919, but falls far below that season, when the juveniles were found by the thousands everywhere along the beach. Table 1 shows the number of clams of each year-class obtained from the Oceano cross-sections since 1918; Table 2 shows the same values in percentages. In 1924 the young were much more numerous at Pismo than at Oceano; 102 were obtained from the Oceano cross-section and 289 from the Pismo section. The actual numbers obtained were increased by 25/16 to correspond to the results obtained by Weymouth. His sections were 25 cm. wide; ours 16 cm.

Another fact which the 1924 trip has shown is that the numbers of the year-class of 1919 are coming fully up to expectations. In accord with the prediction made by Dr. Weymouth, this class is coming into legal size this year, and is responsible for what the old clam diggers claim is the greatest abundance of clams in 20 years. For the 169 clams of this age taken from the Oceano section, the median size was 11.6 cm., the median for the upper 5/7 of the section was 11.53 cm., for the lower 2/7 was 12.03 cm., thus showing a decided increase in size at the lower levels. As the clams of the lower part of the beach are the largest, it is probable that if the section could be extended into the surf to the outer limits of the area occupied by the clams, the median for the entire section would be appreciably increased. Of the number in this class, 24.3 per cent were above the legal size of 4¾ inches or 12.07 cm., while 91 per cent were over 4¼ inches. As the measurements made by the clam-diggers in the field are but roughly made, it is probable that any clam over 4¼ inches is taken, which means that practically the entire year-class of 1919 is at present subject to the strain of the fishery. At

the point of greatest abundance in the section, 23 of the 1919 class were taken from 4½ square feet of beach. Tables 1 and 2 and graph 1 clearly show how this year-class has dominated the total catch since 1919.

The clams from the older year-classes at present furnish but a small proportion of the total commercial catch, which is made up principally of the 1919 class. The ages of 364 clams from the commercial catch of 1924 were read with the following results: 5 of the 1920 class, 313 of the 1919, 33 of the 1918, 6 of the 1917, 7 doubtful. If this can be taken as a representative sample, it would indicate that 86 per cent of the burden of the fishery is being carried by the 1919 group. While this class is now so abundant, it can be expected to melt away with increasing rapidity, as it is subject to the natural causes of mortality coupled with the strain imposed by man.

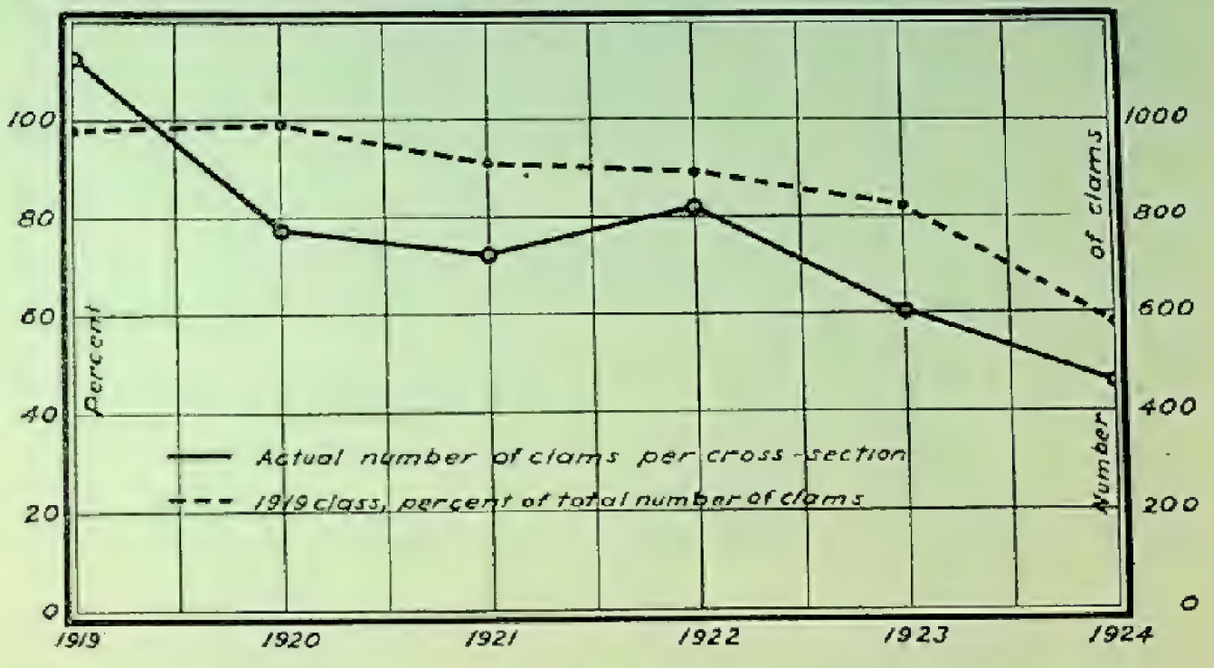

FIG. 26. Graph showing the dominating influence of the year-class of 1919 on the total catch of clams. The solid line shows, with reference to the vertical scale on the right, the actual number of clams obtained each year from the Oceano cross-sections. The dashed line, with reference to the scale on the left, shows the percentage which the 1919 class formed each year of the total catch. The values are from Tables 1 and 2.

During the second day of our stay at Pismo, a heavy storm came up which enabled us to observe the effect of heavy surf on the distribution of the young clams. Graph II-A shows the distribution obtained by Dr. Weymouth at Oceano on November 23, 1920, indicating a marked concentration about the middle of the intertidal zone. As the clams increase in age and size, an increasingly greater proportion is found at lower levels of the beach. This is due to the action of the surf and to the higher mortality on the upper beach. On October 28th, we made a cross-section at Pismo and obtained the distribution of small clams as shown in graph II-B. That night a very heavy surf came up, which quieted sufficiently on the third day to allow the construction of another section at the same location on the Pismo Beach. The distribution as obtained from the second section (Graph II-C) indicated a decided shift to seaward of both the location of the first clams and of the point of greatest concentration. Because of the surf, the work had

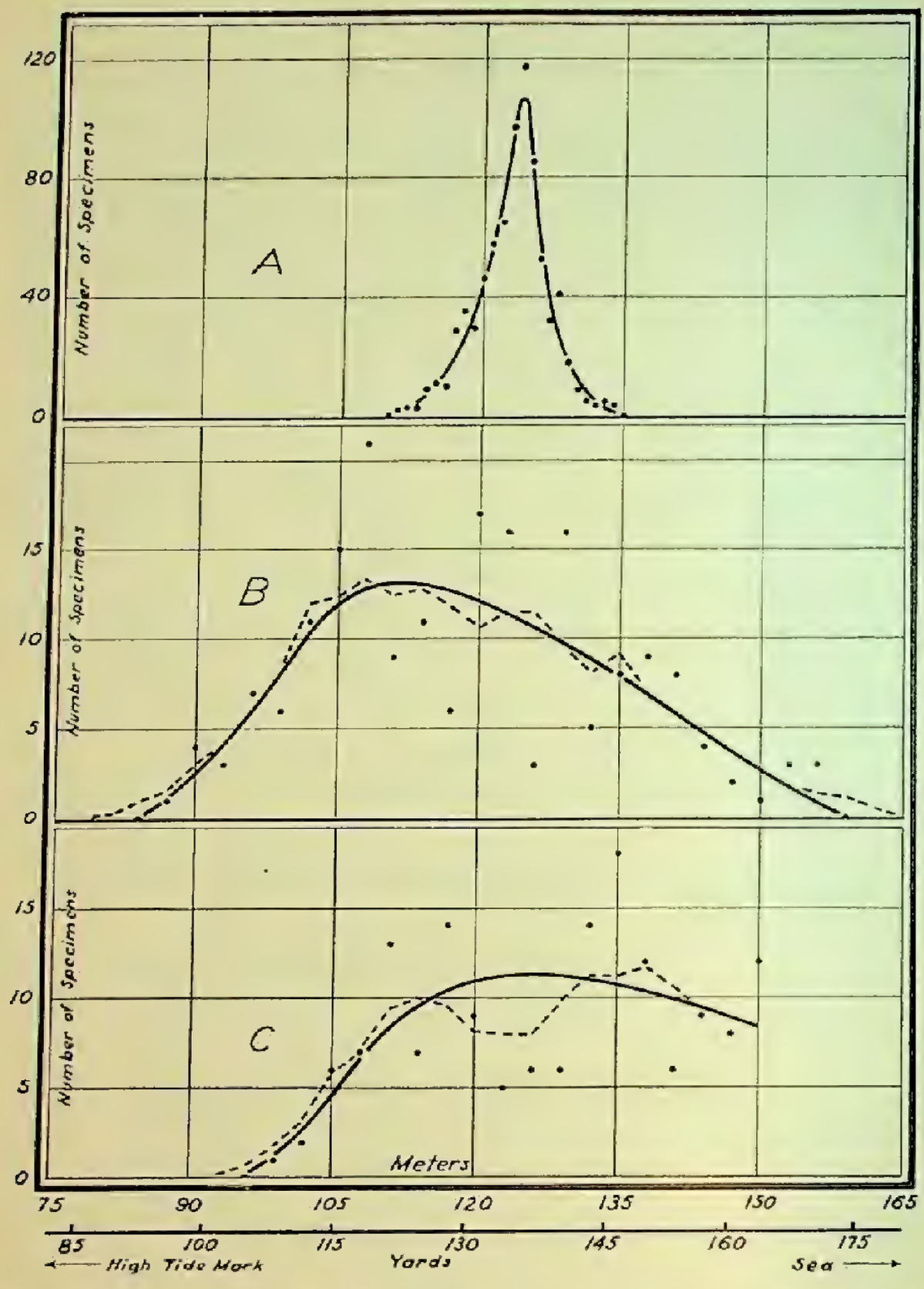

FIG. 27. Graph showing the effect of heavy surf on the distribution of young clams. A. Distribution obtained by Weymouth at Oceano on November 23, 1920, showing normal concentration about the middle of the intertidal zone. B. Distribution obtained by us at Pismo on October 28, 1924; 1924 class only. C. Distribution obtained by us at Pismo on October 30, 1924, at the same location as B, but after two days of very heavy surf; 1924 class only. Dotted lines in B and C show the original data smoothed by fives; solid lines show the approximated curves of best fit.

to be abandoned while still six meters short of the outer limit of the former section, but at that point the number of clams obtained for a unit of area showed no decided falling off. The corner of the concrete retaining wall in front of the Pismo Inn was used as a datum so that the location of the section was positive.

The ages of the clams from the first cross-section at Pismo were read in the field by Dr. F. W. Weymouth and W. F. Thompson, the clams from the other sections were read at the laboratory by means of candling. Those read within a week of the time of capture were found in practically all instances to show plainly the first two winter rings

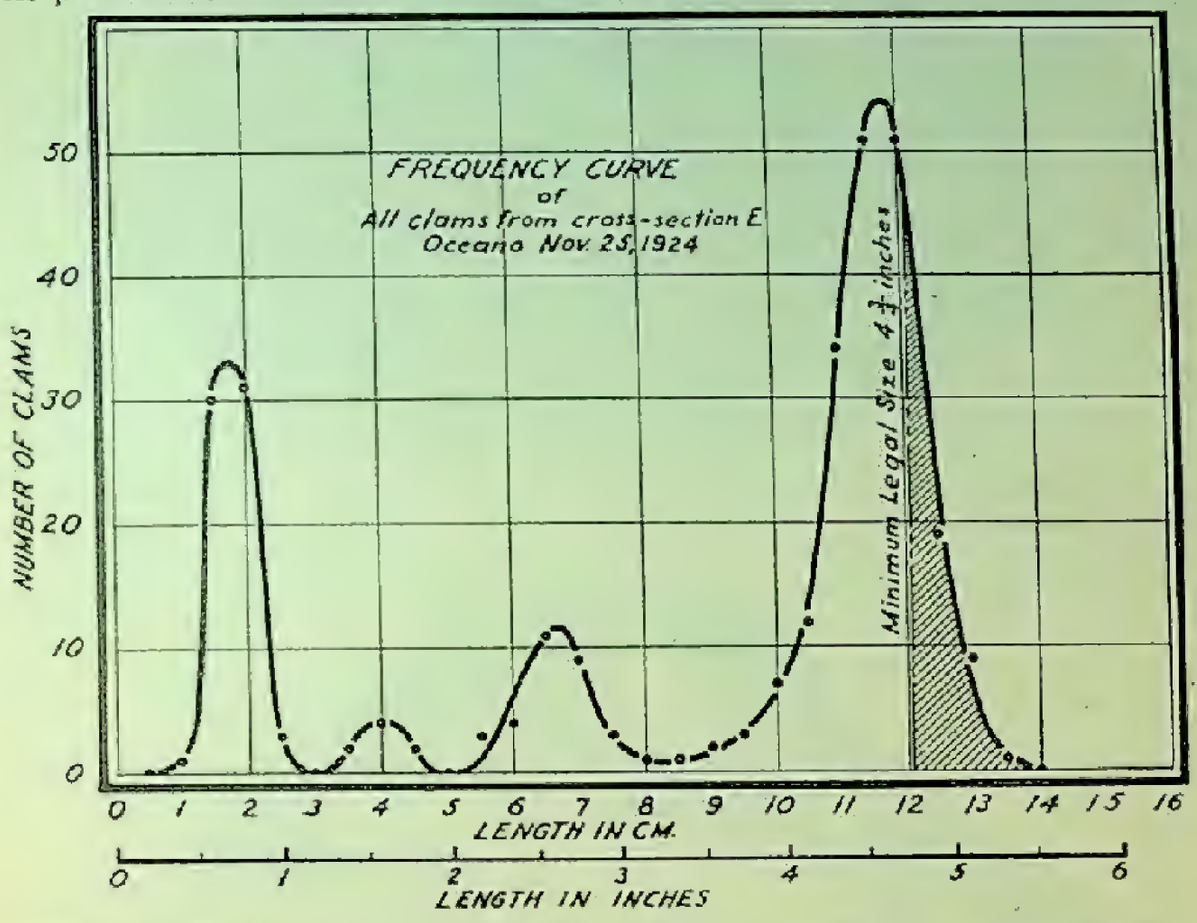

FIG. 28. Frequency curve for the cross-section at Oceano. The mode about the 1.8 cm. length shows the effect of the 1924 spawn. This mode, as well as that about the 4 cm. length, showing the 1923 spawn, and that about the 6.7 cm. length, showing the 1922 spawn, is well defined with little or no overlapping. The great mode about the 11.8 cm. length is largely due to the 1919 year class, which constitutes 58 per cent of the total catch and dominates the year groups of 1920 and 1921. The shaded section shows the proportion of clams which have reached legal size, forming 14 per cent of the catch.

and usually evident traces of the others. Several hundred shells from the commercial catch were candled after they had been cleaned and drying from three to five weeks, and it was found that most of them showed the first ring and traces of others, and a few showed none at all. Six of the shells which showed only the first ring were soaked in water for three days, and when again candled the winter rings showed fully as well as in the fresh clams.

The cross-sectioning work at Oceano has been carried out annually since 1919, when F. W. Weymouth began his study of the Pismo clam. In 1919, 1920, 1921 and 1922, the work was done by Weymouth, in

FIG. 29. Tivela shell in fourth summer. Note annual rings on exterior.

1923 and 1924 by members of the staff of the State Fisheries Laboratory. In 1923, the sections were made by W. L. Scofield and O. E. Sette, who also prepared some of the data. In 1924, two trips were made; the first in October by W. F. Thompson and W. C. Herrington, the second in November by W. A. Selle and W. C. Herrington. Dr. Weymouth and H. C. McMillan of Stanford University were much appreciated members of the party on the October trip.

YEAR CLASSES.

TABLE 1. Year classes. Actual number of clams yielded per cross-section. The figures for 1919, 1920, 1921, and 1922 were obtained from Dr. F. W. Weymouth, Fish Bulletin No. 7; those for 1923 and 1924 from cross-sections made by the staff of the State Fisheries Laboratory, and increased by 25/16 to correspond to the Weymouth sections. His sections were 25 cm. wide; ours 16 cm.

Date	Before 1918	1918	1919	1920	1921	1922	1923	1924	Total
Sept. 11, '19	0	25	1100						1125
Nov. 23, '20	0	6	766	2					774
July 23, '21	0	66	653	3	0				722
Aug. 25, '22	0	48	727	20	18	5			818
Oct. 24, '23	3	17	495	31	9	45	2		602
Nov. 25, '24	0	9	264	8	17	48	11	102	459

TABLE 2. The numbers from Table 1 in percentages.

Date	Before 1918	1918	1919	1920	1921	1922	1923	1924	Total
Sept. 11, '19	0	2	98						100
Nov. 23, '20	0	1	99	0					100
July 23, '21	0	9	91	0	0				100
Aug. 25, '22	0	6	89	2	2	1			100
Oct. 24, '23	1	3	82	5	2	7	0		100
Nov. 25, '24	0	2	58	2	4	10	2	22	100

OCEAN PASTURAGE.

By W. E. ALLEN.

(California Biological Feature Service.)

Throughout the land we are in the midst of, or are just entering upon, a season of astonishing rapidity of plant growth, and of profusion of plant development. This is especially noticeable as regards the grasses and other herbage of similar habit.

Many of us are most impressed by and interested in the change of landscape. In some localities it seems as though the change from dreary stretches of drab or dirty brown colors to a uniform carpet of vivid green had taken place over night. The transformation is inspiring, fascinating, even exciting. One wants to get out and spend all of his time with Nature, in this her most exhuberant season.

Many of us are less interested in the beauties of changed surroundings than in the possible utility of the change. The man who has been hard driven to provide hay and grain for his horse, cattle, sheep and swine has a dominant sense of relief from high pressure and from anxiety at rapidly vanishing stores. Nor can he sit idle on account of that relief, for he must take full advantage of the energies of Nature while she is in her prodigal mood, and he must sow the seeds to replenish depleted stores.

Whatever the view which we take of the spring-time exuberance of plant development, we all notice it and take some sort of interest in it. To most of us, however, this exuberance of activity seems to be confined to land. We do not realize the similarity of its manifestation in the

waters. Nevertheless it is there. Every stream and pond, every roadside pool, every river and lake and every sea shows increases similar in a general way to those so easily recognized on land. All living things play their part in the annual restaging of the drama of life.

Most of us know fairly well that land animals of all sorts are dependent upon green plants for food. The cat which eats mice could not live if mice failed to find food. The bird which lives on grasshoppers might famish if grasshoppers could find no vegetation. Man can not eat meats unless vegetation has been available to enable meat-producing animals to grow and multiply.

It is also true that fungus plants cannot live without green plants to prepare foods for them. The dodder growing on a willow branch will die if the willow dies. Mushrooms can only live on materials, the development of which was at least started, if not carried through, by green plants.

Such things are just as true in the ocean as on land. Seals eat fish, but many of these fish eat green plants. Others eat other fish which feed on green plants. Seals would soon die if all plants could be suddenly taken from the ocean. So with many of our important food fishes, they are dependent upon green plants to furnish food for their prey. (Most of these plants do not look green, but they do have the essential green color substance, though it is under cover.) Others of our food fishes are largely feeders on these plants themselves. Destroy all marine plants, and sardines go out of existence immediately.

Since green plants are fundamentally and preeminently constructive organisms, their whole existence is ordered in the direction of the ground because it is only thus that they can have sufficient time and space in which to change the solid materials of the soil into usable form and to get the vast quantities of water necessary for use in the various building-up processes. Their fixed habit makes it possible for some of them to reach massive size, and most of them are relatively large as compared with most of the water plants, especially those living in open water.

On the other hand, plants of open waters do not need to be fixed because they are immersed in water and the solids upon which they largely depend are distributed through this water in fairly uniform amounts. In fact, a fixed habit would be against their success because it would take them below the areas of abundant light which they must have in order to carry on food manufacture.

Small size is an advantage to them because they are thus less subject to injury and because they can be scattered through the whole body of favorable water in such a way as to make the most of it. Small size also gives them better opportunities for absorbing light, air, and foods and getting rid of wastes because the surfaces of their bodies are thus relatively larger. Another great advantage of small size for green plants in open waters is that it only takes a few hours for most of them to grow to full size after being brought into existence by division or spore formation of their parents. Hence, they may so rapidly increase in a few days of favorable conditions in their area as to completely fill all of its available space. For such reasons as these the pasturage of the open sea, the green plants which serve as basic food supplies for all other living things in their area, is astonishingly different in character from the corresponding pasturage on land. Indeed, it seems to be

difficult to make some people believe that it actually exists, though it certainly does. It is no more possible to have animals in the sea without this basic pasturage than it is to have animals upon the land without the basic pasturage consisting of grasses and similar herbage.

The pasturage of the sea consists mainly of microscopic plants, many of them so small that they go through the meshes of the finest bolting silk like a boy through an open door. Taffeta silk nets will catch most of them. Good filter papers will catch all. These small plants are technically known collectively as the microplankton of the seas.

There are certain regions of open sea in which this pasturage is more abundant than in others. In fact there are probably certain parts of the great oceans which are as nearly devoid of vegetation as are desert areas on land. It has been stated by some experts that tropic seas are little productive while subpolar seas are extremely productive. There has not been, as yet, enough careful study to warrant such a sweeping statement, although one can see certain reasons why it may be true. For one thing, the colder water causes slower growth, longer life and slower decay, hence more generations of these minute plants may survive together than is possible in tropic seas.

Wherever such plants are found their numbers indicate the same tendency to follow cycles as is found in other living things. All through the year one finds every four or five weeks a marked increase in numbers, which is regularly followed by a marked decrease. Sometimes it takes eight or ten weeks to complete a cycle of this sort. This is partly because conditions are variable (*e. g.*, storms and clouds, ocean currents and destructive animals), and partly because the total numbers are made up of many different kinds of plants, each with its own cycle to run. One kind of these may be very abundant for two or three months and then scarcely noticeable for a year. Another may be found all year, but in great numbers for only a week or two.

At the Scripps Biological Station of the University of California, located near San Diego, California, there is unusually good opportunity for studying conditions of this pasturage throughout the year. There it is found that the pasturage gets very scant in December, when there is relatively little light and the temperatures are considerably lowered. Thus, an estimate made from a collection taken on December 29, 1919, gives only about 800 individual plants per liter (about one quart) of sea water at that time. Even allowing for the fact that these plants were so small that nine-tenths of them may have escaped there would only be an estimated total of about 8000 per liter.

Just about a month later a marked change came on rather suddenly, the increase in numbers being easily visible to the unaided eye when the collection was placed in the preservation bottle. The estimates showed that in the morning of January 30, 1920, about 3500 per liter had been caught, including thirty different kinds. Twenty-four hours later, on the morning of January 31, there was an estimate of 22,800 per liter, including forty different kinds. On the next morning, February 1, forty-three different kinds were found with an estimated total of about 85,000 per liter. The increase continued for several days, after which there was a gradual decrease. Another and greater increase is expected to occur in mid March, and a still larger one in April, with probably another in May.

These conditions indicate that the pasturage of the sea shows greatest vigor and abundance in late winter and in spring just as land pasturage does. There is evidence, too, that marine animals accommodate themselves to this abundance of food in the same way that land animals do. Vast numbers of marine fishes lay their eggs in this season, so that the tiny young may have plenty of food at hand. Various kinds of crustaceans, worms and other lowly creatures also produce their young at this time. It is, then, quite apparent that the use of ocean pasturage by animals is strikingly similar to that of land pasturage. If by reason of dark days or some other bad conditions, the ocean pasturage makes scanty growth, millions of little fishes and other young animals will starve to death, and man will find three or four years later that his catches of such animals are very light because so many never had a chance to grow up. While man may not be able to control the growth of ocean pasturage, he must take the same kind of interest in it that he does in land pasturage in order to make the most successful use of it. —*The Santa Catalina Islander.*

NEW LAWS RELATING TO GAME.

The most important changes in the new fish and game laws for 1925–1926, effective July 24, 1925, are as follows:

The open state-wide season for deer remains the same as at present, beginning September 1st, with the exception that a new district has been created, numbered 1¾, comprising the counties of Modoc and Lassen, in which the season is shortened by two weeks at the beginning, the open season being from September 15 to October 15. This law protects does, fawns, spiked and forked-horn deer.

The dove season has been shortened to one month in fish and game districts 1, 1½, 1¾, 2, 2½ and 3, being from September 1 to September 30 only.

The desert, valley and mountain quail season has been reduced to one month (December 1 to December 31) except in district 1½ where the season is from November 1 to December 31.

The season on cottontail and brush rabbit is also from December 1 to December 31. The Sierra hare, or snowshoe rabbit, is now protected at all times.

An open season has been created for pheasants in district 4½ only from December 1 to December 7, with a limit of 6 for the season.

The pelican and shag, or cormorant, has been included among the fish-eating birds and are now on the predatory list.

Gray, or tree squirrels are protected by a closed season until 1927, and the Sierra hare, or snowshoe rabbit, is likewise permanently protected.

The striped bass law is changed making a limit in size of not less than 20 inches in length in lieu of 3 pounds in weight caught with nets, and making it lawful to have striped bass of not less than 12 inches in length with a limit of 5 fish per day caught with hook and line only. Such bass must not be sold.

An open season is created for the taking of sunfish and perch in district 2½ (Clear Lake).

Several new game refuges have been created and some already existing have been enlarged.

Salmon are now protected within three miles of any egg-taking station during such time as it is in operation.

Several other changes of minor importance will be shown on the charts, which may be had upon application to any of the offices of the Fish and Game Commission.

NEW LAWS RELATING TO COMMERCIAL FISHERIES.

A few bills affecting the commercial fisheries were passed by the legislature and signed by the Governor. The more important of these are:

Senate Bill No. 81, By Senator Nelson.

This bill amends the present law which is designed to protect the commercial crab, by correcting certain defects which have made it difficult to enforce the provision that crabs caught in the Northern California districts can not be shipped out of those districts. While there may be some doubt whether it is a necessary conservation measure to prohibit the shipment of Humboldt crabs into other parts of the state, it is highly desirable that while the law stands it be in such form that it can be enforced.

The bill also eliminates the provision that crab meat may be imported from other states. This provision was adopted two years ago but it has not worked out properly. A good many of our own under-sized crabs have been smuggled into port and our crab fishermen claim that these small crabs were being "picked" under cover and the meat disposed of under the guise of its coming from outside the state. The crab size limit of seven inches is the most important of the conservation measures and the law against selling crabs in the form of crab meat was to strengthen that measure.

Senate Bill No. 522, By Senator Hurley.

Amends that section of the Penal Code relating to salmon.

The main object of the bill is to correct defects in the present law which makes the closed season for salmon trolling in the sea unenforceable. The bill makes it unlawful to have any salmon in possession in the ocean districts during the closed seasons. This provision applies to sportsmen as well as commercial fishermen for the closed season can not be properly enforced against the commercial catching of salmon if three salmon a day may be taken on an angling license as has been permitted heretofore. The seasons have been changed somewhat to make enforcement easier and the boundaries of the ocean districts have been slightly changed.

The open trolling season in districts 15, 16, 17 and 18, which include the ocean waters from Santa Cruz to the south line of Santa Barbara County, will be from April 1st to June 15th, inclusive. In districts 7, 10 and 11, extending from Santa Cruz to the Eureka harbor entrance, the open season for salmon trolling will be from May 1st to August 15th, inclusive. In district 6, which will extend from Eureka harbor entrance to Oregon, the open salmon trolling season will extend from June 1st to September 15th, inclusive.

The commercial district in the Klamath River, which was district No. 6, will remain the same but will be described as "Tide water in Klamath River fish and game district." The minimum mesh net which may be used in taking salmon in this district has been raised from six and one-half to seven and one-half inches. It will be unlawful to buy, or sell any steelhead taken in this district or to take steelhead with nets.

The bill prohibits salmon spearing in all districts except district 1½. Assembly Bill No. 930 by Mr. Cleveland, to confine salmon spearing to a

restricted season in district 1½ and to prohibit salmon spearing in all other districts, passed both houses with little opposition but was not signed by the Governor. This bill, if it had become a law, would have eliminated spearing in district 1½ after October 5th and would have done away with spearing on the spawning beds at which time many salmon are speared only to find that they are not fit to eat. The bill also would have placed the minimum fine at $25 instead of $100 as in the present salmon law. It has been found by experience that judges hesitate to fine a man $100 for spearing more than the limit or for spearing where spearing is prohibited.

Senate Bill No. 639, By Senator Chamberlin.

Prohibits salmon spearing within three miles of a salmon spawntaking station. This bill was signed and becomes a law. At salmon spawntaking stations on McCloud River and in Mill and Battle creeks, racks are constructed across the streams to stop the salmon in their up-stream migration, where they are held until their eggs can be taken for the hatcheries. It has been customary for salmon spearers to kill salmon below these racks and to greatly reduce the number which may be taken for the hatcheries.

The salmon open season in district 12 "B" is extended fifteen days to June 15th.

Senate Bill No. 523, By Senator Hurley.

Amends the striped bass section of the Penal Code.

This bill changes the commercial minimum size limit on striped bass from three pounds in weight to twenty inches in length. This measure is not to increase the size of fish which may be bought or sold, it is to give us the same as the weight limit gives us, a prohibition against the commercial possession of striped bass smaller than will be taken with the minimum net mesh limit of 5½ inches. Some were mistaken in thinking that this change was to give additional protection to the striped bass by raising the minimum size limit. To raise the size limit would necessitate raising the mesh limit of the nets; otherwise we would have nets of legal size catching illegal sized fish.

The measure, instead of weight limit, will do away with the tendency to stuff weights in fish to make them come up to weight. It will also enable the wardens to enforce the limit in cases where the fish have been dressed.

The bill also provides that no more than five striped bass a day may be taken in the non commercial districts, Nos. 1, 2 and 3, and that these bass cannot be sold. During the past three years quite a commercial fishery for striped bass has developed in these districts where netting of fish is prohibited. About 250 commercial fishermen, mostly Japanese, have been fishing in these districts with hook and line. Many bass under the size limit are caught on the hooks and are smuggled into the markets. The commercial catch of striped bass has been quite large in these districts and this law is an important conservation measure.

Another provision of the bill is that striped bass, legally caught in the open season, may be held in cold storage until the next open season under definite regulations of the Fish and Game Commission.

Striped bass are given added protection by a change in the limits of district 12-B. This district now ends at Sacramento and no netting of fish is permissible above that point. Netting has been legal as far as Colusa. This measure, which is included in Assembly Bill No. 451 by Mr. Cleveland, eliminates an important striped bass fishing "drift" above Sacramento and is an added protection to the large spawn bass on their way up the river in their spawning migration.

Senate Bill No. 250, By Senator A. B. Johnson.

Regulates the use of sardines in reduction plants.

This bill was drafted by the Fish and Game Commission in collaboration with practically the entire sardine canning industry of California. It takes the place of the former act regulating the use of food fish for fertilizer purposes and inserts into the law the teeth which are necessary to carry out the doctrine enunciated by the recent Supreme Court decision that food fish must be used for food purposes.

The bill prohibits entirely the maintenance of independent reduction plants for the purpose of taking food fish from the ocean and manufacturing them into fertilizer. It allows a canning plant to take an overage up to 25 per cent of its canning capacity in order to put up a marketable pack. This overage is necessary owing to various factors, such as fish unfit for canning purposes and unavoidable over-catches.

Provision is made for the use of the reduction process on fish if manufactured into an edible product. Before such process may be used, a showing must be made before the Fish and Game Commission that the product is, in fact, edible and is intended for human consumption.

The enforcement provisions of the bill are sufficiently stringent so that no person can operate in flagrant violation of the law as happened last year at Monterey. Upon any violation of the law, the court must issue a temporary restraining order and if the complaint is sustained, the plant is closed for three months.

AN AWFUL LOT TO FISHIN'.

By R. C. Calloway.

There's an awful lot to fishin'
  Besides your line and pole.
With the speckled beauties hidin'
  In some cool, deep hole.
There's the voices of the waters
  That go laughing, bounding by,
Showing crystals in the sunlight,
  Reflecting azure from the sky.

There's the frolic of the rapids,
  Coming, gurgling, bubbling on;
There's the stillness of the deep pools
  Where the fishes come to spawn.
There's the cricket's steady chirping
  From his home beneath a stone;
From the flowers in the meadow
  Comes the honeybees' soft drone.

The chipmunk eyes you shyly
  From his safely distant log,
And right down here below you
  Is a silent, bright-green frog.
The catbird comes to scold you
  From his perch upon a limb,
As he peers down at the minnows,
  Just a learnin' how to swim.

You hear the rasping locust
  As you sit there in the sun,
You just feel a part of Nature
  And all the days are one.
You look down in the water
  At the shining stone and sand,
You praise the God that made you
  And bless the guidance of His hand.

You plumb forget your fishin'
  And you never get a bite,
But the silence deep within you
  Makes you feel that that's all right.
What! You say that that ain't fishin'?
  Well maybe that is true,
But I say the man that does it
  Don't go home a-feelin' blue.

I'll admit that there's a thriller
  In the singing of your reel,
But it don't compare in glory
  To the things you hear and feel.
This chumming up with Nature's
  The salvation of your soul.
There's an awful lot to fishin'
  Besides your line and pole.

—*National Sportsman*, July, 1924, p. 46.

CONSERVATION BRIEFS.

Based on license sales there are more than 250,000 hunters and more than 225,000 anglers in the State of California. Think of what this means in terms of supply.

The annual output of the state's hatcheries amounts to nearly 25,000,000 trout and 15,000,000 salmon.

In 1913, 223,045,907 pounds of commercial fish were taken in California waters and 23,207,611 pounds additional entered our ports from Mexico. From the standpoint of fishery products California is now the leading state of the Union.

Certain food and game fishes imported and planted in the streams, such as striped bass, black bass, shad, and catfish are now as abundant as many native species. Shad are more abundant in the Sacramento and San Joaquin rivers than they are in eastern streams from which our supply came.

A minimum of 12,000 deer and 1,000,000 ducks are taken annually by hunters. This represents dividends on a capital stock of great value.

During the past two years 2715 arrests were made by game wardens for violations of the fish and game laws.

The state lion hunter took 30 mountain lions last year and bounties were paid on 195 others making the total kill 225. The mountain lion is the worst enemy of deer.

The are twenty-eight state game refuges, four national parks and three national monuments in California where game is given complete protection. The area comprises about three per cent of the total area of the state.

All shore birds, except the Wilson snipe; all rails; the wood duck and band-tailed pigeon have closed seasons which protect them the year around.

Owing to their depletion, elk, antelope and mountain sheep are given total protection.

Fur-bearing mammals—mink, fisher, otter, fox and skunk—are protected during the time of year when their fur is not prime, trapping being restricted to the winter months, Oct. 15 to Feb. 28.

The only song birds not protected by law are the blue jays, butcher bird, English sparrow, sharp-shinned hawk, Cooper hawk, duck hawk, great horned owl, California linnet and blackbirds in the districts north of Tehachapi. The black-listing of the butcher bird and the great horned owl is of doubtful utility for both as a rule do far more good than harm.

Federal as well as state laws give protection to migratory and insectivorous birds.

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All material for publication should be sent to H. C. Bryant, Museum of Vertebrate Zoology, Berkeley, Cal.

August 24, 1925.

"No amount of game laws will bring an improvement in the output of wild animal life unless there be provision for adequate food and shelter."—J. Grinnell.

I. ZELLERBACH.

The sportsmen and conservationists of the state are to be congratulated upon Governor Friend Wm. Richardson's appointment of Mr. I. Zellerbach of San Francisco, as a State Fish and Game Commissioner, vice Mr. George H. Anderson of San Jose, who resigned May 5, 1925.

Mr. Zellerbach is a prominent and successful business man, a lover of the outdoors and its wild life as well as a conservationist. We are sure he is fully cognizant of the responsibilities attaching to the position of Fish and Game Commissioner.

There is no salary attached to this position. A man of Mr. Zellerbach's capacity and business experience could not be drafted for the position for pay, consequently both the sportsmen and the commissioners are to be congratulated on Mr. Zellerbach's appointment.

THE HUNTING AND ANGLING LICENSE INCREASE.

Four years ago when the Western Association of Fish and Game Commissioners met in Sacramento, it was the sense of the meeting that all western states should increase their hunting and fishing license fees in order to afford better protection and conservation of fish and game.

At the legislative session four years ago it was necessary to expend all energy upon blocking the move to place the work of the Commission under the State Department of Agriculture, thus making practically the oldest Commission in the state lose its identity.

At the last session of the legislature attempts were made to place all the income from hunting and angling licenses in the general treasury, and it seemed inopportune to urge increases in license fees which might not be usable for fish and game conservation. This spring, California attempted to fulfill the promise of four years ago. She was the last western state to seek increased licenses, for Washington, Oregon and Nevada have all secured worthwhile increases.

Loyal support by the sportsmen of the state and hard work by the Commission secured the passage of the bill but it received the pocket veto of the Governor.

With the increased funds the Fish and Game Commission planned to start on an augmented program of restocking and law enforcement. This program will now have to await the time when it can be financed.

SIX NEW GAME REFUGES.

California is keeping well apace with other states which are turning to the game refuge as one of the fundamental means of game conservation. Every legislature which has met during the past

ten years has added one or more refuges to the chain now existing in the state.

At the past session six additions were made: A new refuge (1-N) for Siskiyou County; refuge (1-Q) for antelope in Lassen County, which joins the Nevada refuge; a fine new refuge (1-O) on Silver Creek, an area on the American River watershed; addition to the Deer Creek refuge (1-G); all of the lands of Leland Stanford Junior University constituting a fifth one (3-G). A special bill passed provides for the Tawquitz refuge in the San Jacinto mountains, a refuge especially designed for the preservation of the southern mule-tailed deer. Thus does growing interest in conservation assure the state of the safety of a nucleus of breeding stock.

Modoc mule deer receive increased protection. It has been apparent for several years that added protection for mule deer in Modoc County was necessary. The legislature passed a bill providing for a shorter season and for protection of "forked horns." The latter provision is one which may be very difficult to enforce. For the hunter to always be able to determine whether a deer has two or three points is difficult, but the extra care necessary is the very thing which will sufficiently cut down the toll taken. It will also be a constant reminder to the hunter of the necessity for giving this fine large game animal a fair chance to survive.

PROTECTION TAKEN FROM BEAVER.

Senate Bill No. 540, introduced by Senators Boggs, Inman, Sharkey and Rush and supported by landowners along the lower Sacramento and San Joaquin, met no organized opposition and was signed by the Governor.

Complaint that beavers cut down willows planted for bank protection and endangered levees in reclamation districts by their large burrows formed the main argument for inserting into the old law which gave beaver protection this simple clause: "except in fish and game districts 1, 2 and 3." As a result, the beaver is to receive no protection in the few places in the state where it is still to be found. Elsewhere in the state year-around protection is offered it.

The ten years of protection has allowed the beaver to increase sufficiently to cause considerable trouble to agriculturists in the delta region. Thus, Cailfornia, like several other states, has been forced to relieve the situation brought on by increasing damage due to the beavers.

It is hoped that trappers will be considerate enough to not violate the closed season on this fur bearer so that all the animals killed may furnish prime skins.

PIONEER WARDENS.

In recording the death of two of the state's oldest game wardens from the standpoint of years of service, attention is called to those years when enforcement of the game laws was much more difficult than at present. Mountaineers resented interference and a deputy took his life in his hands when making an arrest. To the oldtimers who faithfully enforced law under difficulties we owe the present improved attitude on game laws and present day deputies owe a lightened burden to them. Would that there were some way of more fittingly honoring these pioneers in game protection!

IN MEMORIAM.

Tom W. Birmingham.

T. W. Birmingham of Red Bluff, deputy fish and game commissioner, Tehama County, departed this life on August 13, 1924. Tom, as he was familiarly known to friend and foe alike, entered the service of the Fish and Game Commission on September 11, 1903. At the time he entered the service, fish and game law enforcement was a difficult task especially so in the mountains of northern California where fish and game violators were a law unto themselves. By his fearlessness and fairness to all those with whom he came in contact he was the principal factor in bringing Tehama County into the fold of conservation, for he had the respect of all law abiding citizens and the officers of the law and of the courts.

Wm. J. Moore.

With deep regret we record the passing of Assistant Commissioner William Jewett Moore at his home near Napa on May 4, 1925.

Deputy Moore was born in Jackson, Amador County, California, in 1859. Early in life his parents moved to Texas and later to Kansas City. When twenty years of age he returned to California and worked for the Southern Pacific Company as fireman and engineer. In 1883 he married Blanche Foster at Healdsburg. From 1883 to 1888 he was engaged in dairying at Healdsburg. An epidemic of anthrax wiped out his herd in that year, and he entered the employ of the Wells Fargo Express Company, as messenger and guard. With the exception of a few years during which time he was in the contracting business in the state of Wash-

ington and in Healdsburg, he was with the express company. He left their employ on September 1, 1907, when he was appointed regular deputy with the Fish and Game Commission, with headquarters at Napa. While living at Napa, he nssisted the late Alonzo Lee in the enforcement of the fish and game laws and was recommended by Lee for appointment as a special deputy. His first appointment was made October 27, 1905.

WM. J. MOORE.

Deputy Moore was an exceedingly trustworthy and conscientious employee. During the years of service he gave the state he was frequently, by the nature of his employment, placed in dangerous and difficult positions. In every instance he came through with credit to himself and to the state which he served.

He is survived by his wife and six children: Mrs. Jack Rose, Helen Moore, Mrs. Jack Linderman, Blanche Moore, George Jewett Moore and Walter Moore. The Fish and Game Commission extends its most sincere sympathy to his family.

THE PUBLIC SHOOTING GROUNDS—GAME REFUGE BILL.

The game refuge public shooting ground bill after having passed the house failed of consideration by the senate. Undaunted by a second defeat those supporting the bill will endeavor to have it passed at the next session of congress. The statement issued by the president of the American Game Protective Association follows:

While the game refuge-public shooting ground bill did not become a law at the session of congress just concluded, friends of the bill, and conservationists generally, should be gratified at the very substantial progress made and the distinct victory won by the passage, in the house, of the bill on February 21, after two days of vigorous debate, by the substantial vote of 211 to 114. This decisive affirmative vote was obtained in the face of the fact that the vote was taken on Saturday when at least fifty supporters of the bill were absent for week-end visits at home. Support for the bill, on final vote, came from all parts of the country and from both parties, as it should, there being no politics in conservation.

The bill met misfortune in the senate on account of the tremendous congestion and filibustering on various bills, including obstructive tactics against this bill by Senator Smoot of Utah. Practically all other opposition to the bill in the senate had been eliminated, but notwithstanding that, it was impossible to bring the bill to a vote and it failed of passage along with a number of other measures of nation-wide importance. It is said that one thousand bills passed by the house failed to receive action by the senate.

The measure is now in a stronger position before the country, and in congress, than ever before. You and all other supporters are to be heartily congratulated for the fine, unselfish work that you have done for it.

The bill will be reintroduced at the opening of the sixty-ninth congress next December, and we feel confident in predicting its enactment during that session.

THREE PREDATORY BIRDS WORTH SAVING.

Three birds of prey should be accorded special protection. The California condor, the largest land bird in North America, was nearly exterminated in the early days by those desiring to brag of having killed a bird with a wing spread of over nine feet. One of the most interesting members of the bird fauna of the state, this bird is much sought after by visiting ornithologists who wish to at least catch a glimpse of this giant vulture.

The osprey, or fish hawk, one of the more beautiful and interesting of the larger hawks, continually meets death at the hands of the angler who maintains he is saving fish by destroying a "fish eater." One of the attractive features of Yellowstone is the nests of osprey on old pine stubs at the edge of the water. The same can be said for some of the mountain lakes of California.

To this class of candidates for extinction will soon be added the golden eagle, a famous destroyer of ground squirrels and larger rodents. All three of these birds are nongame birds protected by law. Additional protection is furnished the first two since scientific permits do not allow the taking of the nest, eggs or specimens

of these birds. It is quite possible that the situation demands the adding of the golden eagle in this category.

Any man who kills any one of these three birds should understand that he is endangering the persistence of one of the more interesting predatory species of the state. If we are to conserve our natural resources, we must have a care that the selfish cry for destruction of predatory species does not drive us to totally exterminate a bird that future generations will regret having lost.

FISH NUMEROUS IN CLEAR LAKE.

In line with its newly determined policy of prosecuting surveys of the various lakes and streams of the state, the California Fish and Game Commission has just completed such a survey of the Clear Lake region in Lake County.

Few lakes in the state have so large a native fish fauna as has Clear Lake. At least fifteen varieties of fish, many of them forming staple articles of diet with the native Indian population, inhabit the waters of the lake. One of the commonest fish which can be caught on almost any kind of bait is a fresh water smelt called "hitch" or "haitch." A "black fish," a very large minnow, a chub, the Sacramento perch and the Sacramento sucker are also common varieties.

In addition to the native fish, many introduced varieties thrive. Some of these fishes were planted by the Fish Commission thirty-three years ago. Two kinds of black bass, crappie, blue-gilled sun fish and three varieties of catfish are the more notable ones. An introduction of brown trout a few years ago appears to be thriving and will soon offer good sport.

According to G. A. Coleman, biologist in charge of the investigation, the reason for this wealth of fish life apparently lies in the splendid food available. The bottom of the lake furnishes a breeding ground for worms and small mollusks, and abundant vegetation furnishes a safe retreat for numerous crustaceans and insects. A quantitative survey of the plankton showed that for every cubic foot of water in the lake there are five grams of suitable food for fish.

With accurate information relative to the food supply in the various waters of the state, it is certain that the Fish and Game Commission will make fewer mistakes and attain greater success in supplying the lakes and streams of the state with fish. Lake County residents and those who are able to visit the lake should be gratified with the showing made in the investigation. Few lakes in the state have a finer fish fauna.

FIG. 30. A California gray fox caught in a trap by Guy O. Glazier and in six weeks tamed so that it is handled barehanded. Photograph by G. O. Glazier.

OREGON COMMISSION OPPOSES COLUMBIA RIVER DAM.

The Oregon fish commission has gone on record as opposing the proposed Priest Rapids dam project on the Columbia River in eastern Washington.

The commission has taken the stand that construction of the dam would jeopardize the salmon fishing industry on the Columbia River, and has requested the state attorney general to bring an injunction suit to prevent consummation of the proposal.

The Priest Rapids project is a huge one, backed by the General Electric Company. It is proposed to build a dam 90 feet high and about two miles long, which would cost in the neighborhood of $14,000,000. The total irrigation, reclamation and power project would require nearly $50,000,000 to complete as planned.

The Oregon commission believes that it would be impossible to devise a fish ladder over a dam of that height that would handle the fish migration satisfactorily.

Practically two-thirds of the salmon spawning grounds of the Columbia River are above Priest Rapids, and the commission believes that construction of the dam would materially reduce the catch of salmon in the Columbia River.

The blocking of the Electro-Metals project on the Klamath River in California has set a precedent that may help greatly in future attempts to save migratory fish.

THE ADVERSE COMMENTS OF THE ROD AND GUN DEPARTMENT OF THE SAN FRANCISCO EXAMINER.

Sportsmen throughout the state have inquired as to the adverse comments which continually appear in the Rod and Gun Department of the San Francisco *Examiner*.

The reasons why the items appearing in this column are so one-sided and biased are apparent, when it is known that many favorable comments to the Commission's work sent in to this department go into the waste basket. As an example of the source of some of the adverse comment may be cited the Dorsey case.

A market fisherman named Dorsey of Isleton, California, criticized the work of the Commission and the Commission's deputies in one item, signing himself "President Wild Life Association."

Investigation showed that this man had been apprehended with striped bass undersized and over the limit. The bail was

Fig. 31. Not cattle but wild deer held in capitivity temporarily in Yosemite. Photograph by H. C. Bryant.

set at $40. When the case was called, Mr. Dorsey failed to appear and the bail was forfeited. Inquiry as to the organization which he represented failed to show that there was any such organization. Evidently he is the sole member in the district where he lives. These facts were given to the Rod and Gun column of the *Examiner* but have been very carefully kept out of print.

FRIENDS DEMAND JUSTICE.

Deputy Fish and Game Commissioner James S. White was shot and killed by prohibition enforcement officer Vale while performing his duty as a deputy sheriff in a raid on a hotel in Shasta County. Vale was tried before a judge whom all the friends of White maintained was prejudiced. The help of a special prosecutor was offered by the Fish and Game Commission, but was refused. The friends of "Jim" White, including the Fish and Game Commission, have never been satisfied with the verdict and have sought to obtain justice by having the legislature pass a resolution providing for the appointment of a special prosecutor. This attempt was successful and Attorney General Webb has appointed Dr. Thomas B. Dozier, a well known attorney of San Francisco, as a special prosecutor.

HUNTING ACCIDENTS, 1924.

According to custom, we offer a compilation of the hunting accidents for 1924. The sole reason for mentioning names and giving the heart-rending details is to bring vividly to the mind of every reader the results of carelessness and the need for emphasizing the "look before you shoot" motto. Should these compilations save the life of even one person, the energy expended would be many times worth while.

Attention is again called to the fact that no dependable statistics are obtainable from the State Board of Health, and that the accidents here recorded are based entirely on newspaper items, which admittedly are not always accurate.

HUNTING ACCIDENTS, 1924.

Killed.

Name	Shot by	Date	Locality	Circumstances
Aro, Faustine	Squirrel hunter	Jan. 17	Los Angeles	Stray bullet from squirrel hunter's gun.
Baker, R. L. (50)	Self	Oct. 10	Low Gap, Mendocino Co.	Head blown off in crossing rail fence.
Beckwith, John A.	Self	Sept. 1	Finley Camp, near Etna Mills, Siskiyou Co.	Jarred butt of gun on the ground.
Beck, Wm. (9)	Brother Paul	Feb. 6	Yreka, Siskiyou Co.	Older boy placed loaded gun on rock to see where he struck target, gun exploded accidentally striking brother.
Bragg, Marion F. (24)	Brother Verne (22)	Dec. 1	Indian Ranch, Yuba Co.	Stepped in front of gun as it was fired from truck at a coyote.
Bulgar, Lewis (10)	Brother John (11)	Sept.	Brighton, Sacramento Co.	Gun discharged when trying to see if loaded.
Fox, Lawrence	R. J. Teck	Dec. 8	Mt. Eden, Alameda Co.	While running to cover, companion tripped and fell, discharging gun.
Lesher, Joseph H. (65)	Self	Nov.	Quincy, Plumas Co.	Trigger of shotgun caught on projecting piece of iron on entering cabin.
McCollum, Wayne (23)	Companion (?)	Nov. 11	Willows, Glenn Co.	One of five guns of hunting party fired at geese shot away face of victim.
Pratt, Samuel S.	Self	------	Red Bluff, Tehama Co.	Attempted to hand shotgun to companion in crossing stream.
Rennick, John (17)	Self	Sept. 23	Dyerville, Humboldt Co.	Attempted to dislodge stuck cartridge by tamping butt on ground.
Scott, Roy (18)	Self	Nov. 28	Chico, Butte Co.	Attempted to club wounded goose with butt of gun, accidentally discharging it.
Tutt, E. F. (60)	Self	May 1	Sebastopol, Sonoma Co.	Shot through heart when attempting to clean gun.
Ullery, Leigh M. (14)	Self	Sept. 18	Hough Springs, Lake Co.	Gun discharged when victim slipped and fell.
Wilson, Edward (40)	Son Russell (15)	Sept. 10	Manton, Tehama Co.	Party attempted to surround deer, bullet struck victim in back of head.

HUNTING ACCIDENTS, 1924.

Wounded.

Name	Shot by	Date	Locality	Circumstances
Alberry, Glenn	Ralph Edwards	Nov. 10	Manton, Tehama Co.	Companion fired gun at flock of quail, slightly injuring victim.
Barber, John (23)	Self	Nov. 8	Berkeley, Alameda Co.	Gun discharged when geting out of row boat to a blind.
Bartelle, Vernon (15)	Brother Joseph	Oct.	Redding, Shasta Co.	Shot in hip by accidental discharge of gun in hands of brother.
Broderick, Robt.	Self		Eureka, Humboldt Co.	Dropped gun while hunting ducks, receiving bullet in thigh.
Bruno, Francis	Companion	Aug.	Wooden Valley, Napa Co.	Shot through calf of leg when revolver dropped from holster of companion.
Carpenter, Cecil (18)	Self	Dec. 12	Gridley, Butte Co.	Load from accidentally discharged gun tore hole in left breast, making dangerous wound.
Cassidy, Elwood (19)	Melvin Bennett	Aug. 7	Napa, Napa Co.	Companion's gun discharged while removing cartridge, shooting victim in left thigh.
Ferguson, Oscar	Self	Jan. 17	Hanford, Kings Co.	Trigger caught on trousers as victim stepped into blind, maiming left hand.
Gaw, Harry (10)	X. V. Reynolds, 27		Knights Landing	Companion was loading gun when accidentally discharged.
Gori, Manuel	Self	Nov. 12	Pinole, Contra Costa Co.	Gun discharged as victim climbed ashore from boat, wounding right arm.
Habin, Witter (13)	Self	May 8	Berkeley, Alameda Co.	Shot in right foot by accidentally discharged rifle.
Koster, George (22)	Self	Aug. 30	Willits, Mendocino Co.	Right thumb shot off by accidentally discharged gun.
Laffranchini, Lawrence 16	Self		Hayfork, Trinity Co.	Stumbled over log, receiving bullet in shoulder.
Leist, C. C.	Self	Nov. 30	Susanville, Lassen Co.	Shot in left thigh while duck hunting.
Lewis, Edwin	Self	Nov. 11	Woodland, Yolo Co.	Heel of right foot shot off when gun slipped from shoulder.
Marlow, Leroy (21)	Self	Dec. 8	Marysville, Yuba Co	Tried to release jammed shell in automatic shotgun, receiving discharge in lower arm, which was amputated.
Matthews, David (12)	Companion	May 20	Martinez, Contra Costa Co.	Companion dropped shotgun, discharge lodging in abdomen and arms.
Stark, Shield (11)	Self	Nov. 29	Berkeley, Alameda Co.	Caught trigger of shotgun on seat of boat while duck hunting.
Swanson, Emil	Gus Flannigan	Sept. 25	San Diego	Swanson fastened deer on running board and was wounded when fired on from brush.
Tedford, Ten	Unknown hunter		Woodland, Yolo Co.	Shot in knee while hunting deer.
Williams, H.	Unknown hunter	Sept. 9	Santa Barbara	Dangerously wounded when mistaken for deer.
Sulzman, Lester (23)		Dec. 13	Sacramento	Placed gun in rear of automobile in starting on hunting trip; received charge in right arm.

A TRAINER WITHOUT EQUAL.

How did he do it? What treasures are to be found in old files! The accompanying pictures evoke these thoughts. These photographs have not seen the light for many a long day, so long, in fact, that no information is available further than found on the back of one of them which is as follows:

Fig. 32. California valley quail trained to harness by Fred Cuche, eighty years old at the time the picture was taken.

"Fred Cuche of Ocean View, the veteran dog trainer, is eighty years old, and the only man that has ever succeeded in training a California valley quail to work in harness, and a dog to carry a live quail in his mouth without ruffling a feather.

These pictures are for sale for the benefit of an old broken-down sport."

Doubtless Mr. Cuche is long since deceased, but we are glad to pass on evidences of his interesting work in his old age. No one can gainsay but that he was the one and only person who ever had a quail trained to harness. However, we have heard of others who have succeeded in training a bird dog to hold a live bird without hurting it.

Nowadays one seldom finds a person

who brings out the best qualities of a bird dog. The sportsman buys a trained dog and has little time to bring out his finer qualities. The trainer in turn, disposes of his product as soon as possible, so that without the needed time and patience a dog such as Mr. Cuche's is seldom to be seen.

At the former state game farm at Hayward some valley quail became tame enough to handle so that they could be carried around on the finger, and allowed to pick flies from a screen. Even birds as tame as this could hardly have been expected to display the fortitude shown by the bird in the pictures.

You who have studied these photographs and stopped to read have honored the memory of Mr. Cuche, who, because of his interest in and love of animals and of clean sport highly deserved to be memorialized.

Fig. 33. A result of patient work, a valley quail trained to harness. Fred Cuche was the trainer.

VIOLATOR OF DEER LAW CAPTURED.

A slayer of deer out of season was captured through the untiring efforts of deputy G. O. Laws in Trinity County. Having heard that three men in the vicinity of Wildwood were shooting deer, he went after them on horseback. When apprehended, one of the men pleaded guilty and was fined $25.

On his return from his chase over the Trinity County snows the warden's horse lost its footing on the ice and slid fifty feet down an embankment. The warden saved himself by grasping the branches of a tree.

LOWER CALIFORNIA DUCKS ARE BANNED IN CLOSED SEASON.

The bringing of ducks from Lower California after the California open season has ended is now a thing of the past. In this connection, Webb Toms, one of San Diego County's game wardens is quoted as follows: "All spring shooting sportsmen are hereby warned to bring no more ducks over the line. Customs officers in all the border ports, as well as in the ports of San Pedro and San Diego, have been notified and anyone with ducks in their possession will be arrested. That's final."

DEER CONDITIONS ON THE KAIBAB FOREST.

The solution of the Kaibab deer problem continues to occupy the attention of government officials and meanwhile conservationists everywhere are waiting for progress reports. No conservation problem in recent years has had a more practical bearing or attracted greater interest.

A letter from S. B. Locke, associate forester, who has been in close touch with the situation, reports as follows:

The deer were in very poor flesh last fall and rather constant losses have taken

place throughout the winter. Well distributed storms over the lower elevations enabled the deer to scatter out early in the season and enabled them to obtain sagebrush for feed, so that no serious losses from starvation have so far occurred.

The hunting which has been allowed has been limited to a relatively small section and was carried on under close supervision. As the men entered the game preserves their firearms were sealed until they reached the hunting camps, and there we had a number of men stationed who rode the hunting areas. Only a limited number of hunters were allowed to enter a camp at once, so that overcrowding was impossible. We attempted in every way possible to establish an attitude of good sportsmanship at each camp, so that careful shooting would be the rule. The results were extremely encouraging and a careful check over the areas indicated the escape of very few wounded animals. The greatest trouble came in the hunters hanging up game and being unable to return to it.

FIG. 34. Fred Cuche and his well-trained dog, who carried a live quail without ruffling a feather.

Men who had seen the deer in numbers on the summer ranges where they were very tame had a big surprise when they went out on the winter range and found out that it was quite difficult to obtain

shots at the animals which they desired. Whenever they are available I will send you copies of reports on the Kaibab situation.

Provision will be made for the capture and rearing of several hundred fawns which will be shipped to other sections, and trapping facilities have been developed to a point so that shipments of the younger animals, which may be trapped during next fall can be made.

BOY ANGLERS ENCOURAGED.

As one of the features of boys' week in Sacramento, the Rotary Club stimulated sportsmanship among the boys by offering a fish line to the first one hundred appearing at Southside Park on May 2d. Splendid prizes were also offered for the largest fish taken. Officers of the Fish and Game Commission were on hand to demonstrate fly casting, and motion pictures of trout were shown by the educational department of the Commission. The lake in Southside Park, originally a brickyard quarry, has been stocked many times with bass, crappie and blue-gilled sun fish. Before nine o'clock one boy had secured his limit of ten fish, which included nine fine large crappie and one large blue-gilled sun fish. In the fly casting exhibition, it was shown that crappie can readily be caught on flies.

Proper lessons in sportsmanship given to boys pay big dividends, and undoubtedly limit r e g u l a t i o n s, and conservation methods will henceforth prevail among the boy anglers of Sacramento as a result of the effort made during boys' week.

DESTRUCTION BY WASTE OIL PROHIBITED.

The bill to prohibit oil pollution in navigable waters (Public 238, S-1942), was approved June 7, 1924. This bill was a compromise measure resulting from a number of other bills with similar objects in view. It forbids the dumping of oil in navigable coastal and inland tidal waters. A penalty is provided of not less than $500 nor more than $2,500. With the number of oil-burning and oil-transporting steamers rapidly increasing, the amount of waste oil that has been dumped into the sea along North America and Europe has increased rapidly within the last few years.

This oil is deadly in its effect on the marine life with which it comes in contact. It destroys oysters and other shellfish, destroys the fertility of fish spawn, and covers the feathers of ducks, geese, and other water birds, causing the death of untold thousands of them each year; all of this in addition to its destructive effects along the shore, where bathing beaches and other attractive parts of the coasts have been seriously damaged by drifting oil.

Another bill, H. R. 9199, to prevent pollution by oil of navigable rivers and their tributaries, passed the house on February 16, 1925, but was lost in the crowded state of the calendar in the senate at the end of the session.—*National Parks Bulletin.*

A PRETENTIOUS GAME PRESERVE.

The State Conservation Commission has granted incorporation papers to a group of sportsmen of southern California who have acquired a large area in Kern County in the Tehachipi mountains as a game preserve. The area is to be fenced and stocked with various kinds of game including buffalo, elk, deer and upland game birds. Membership in this millionaire's club will be a thousand dollars, and with the $500,000 capital they expect to thoroughly stock the area and to eventually furnish sport to the members.

WHAT DO FISH EAT?

It took depredations on crops to bring about the stomach examination of birds in an effort to ascertain their exact food. We have found out something about the food of certain marine mammals because of their supposed effect upon fisheries. The need for exact evidence as to the food of various fishes has been in evidence for some time, but seldom have attempts been made to obtain data through analysis of stomach contents. A. S. Pearce of the University of Wisconsin is obtaining evidence on another phase of the problem as shown by the title of a recent paper in ecology (Vol. 5, pp. 254 to 258) entitled "Amount of Food Eaten by Four Species of Fresh-Water Fishes." The paper gives the weights and volumes of food eaten by rock bass, pumpkinseed, largemouth black bass and bullheads kept in jars. Such food as minnows, grasshoppers, dragon-fly nymphs, caddis-fly larvæ, crayfishes, amphipods, snails and earth worms were used in the experiments. The food was measured both in volume and weight, and more than the fish would eat was supplied it per day. The bullheads consumed the largest proportionate percentage of food according to its own volume. The maximum amount eaten by a single fish during a twenty-four-hour period was as follows: Bullhead, 55 per cent; largemouth black bass, 30 per cent; pumpkinseed, 16 per cent; rock bass, 10 per cent.

The largemouth black bass is apparently most specialized in its food habits, refusing snails, caddis-fly larvæ and usually, crayfishes. Apparently various species prefer certain foods.

"It will not be possible to ascertain, in a scientific way, the number of animals that each type of environment is capable of supporting until the rate at which each species is consuming materials from the various food resources is known." The value of investigations of this kind is therefore evident.

CONSERVATIONISTS STILL FIGHT TO RESTORE LOWER KLAMATH LAKE.

Whether the Klamath Lake bird reservation is to be or not to be has not been definitely settled. It had been hoped by conservationists that the waters might again be turned in to the reservation before it is too late. However, complications have prevented restoration.

The accompanying map will give our readers a better idea of the splendid nesting and feeding grounds available for waterfowl before the lake was drained. One is also able to visualize the bleak expanses of alkali which now have taken the place of the lake bottom. The shallow character of the lake and its abundant growth of tules as indicated made it one of the most famous breeding grounds for waterfowl in western North America.

The situation is such at the present time that a strong pull by conservationists will restore this famous breeding ground which is so necessary to furnish California with a worthwhile quota of ducks and geese.

CONFESSIONS OF A MARKET FISHERMAN.

"I was working some sloughs for striped bass during a closed season. I set my net and secured a fine boatload of fish. It was a foggy day and I heard voices quite near me. I felt sure that this must be the game warden and a companion. I succeeded in escaping attention, even though the boat was close to me, and was so frightened that I dumped the fish in the tules. Afterwards I took a sack and got most of the fish, which instead of selling, I gave to my friends. I was so badly frightened, having just escaped detection, that I have never violated the law since."

THE REASON FOR THE BAN ON NIGHT SHOOTING.

Wildfowl naturally feed in the daytime, and formerly did secure their food during the daylight hours, before the great influx of hunters with their constant bombardment drove the birds from their feeding grounds during the daytime and compelled them to feed at night. Incessant shooting during the daytime drives the birds far out on to the open water or at sea, where there is no food for them, but they rest undisturbed until shooting has ceased at sundown. Immediately after the shooting ceases, one may see the birds coming back to their feeding grounds. The hunting of wildfowl at night is not permitted because it is most essential that the birds be allowed to return to their feeding grounds at night undisturbed. If hunting at night were permitted, the birds would be constantly disturbed and harassed, with the result that they would be unable to obtain any food, and eventually many of them would starve to death.

It is not sportsmanlike to hunt during the night time and very few people indulge in the practice, since one may secure no real enjoyment out of it, and the birds killed or wounded at night often cannot be retrieved. Night shooting, therefore, violates the ethics of the great majority of sportsmen, and not only is seriously detrimental to the conservation of wildfowl, but destroys the shooting opportunities of the great mass of sportsmen who take their pleasure hunting during the daytime.

Wildfowl seem to know when the closed season commences, and they start to return to their feeding grounds immediately after sunset, which is the time fixed by the federal law, and under most state laws, when the night closed season commences. The flash from guns fired at night really frightens the birds more than the noise of the guns, and tends more to "burn" the birds out of a section where this night shooting is indulged in. It is absolutely essential that we provide places where the birds may rest and feed, and to allow them to reach these places undisturbed, if we are to have good shooting conditions and are to perpetuate the species. A duck cannot constantly live in the air.—*Fins, Feathers and Fur*, December, 1924, page 283.

OREGON, LIKE CALIFORNIA, HAS INADEQUATE FUNDS.

The *Oregon Sportsman* (May, 1925) has quoted at length from the article in the last number of CALIFORNIA FISH AND GAME regarding an increase in hunting and angling licenses to meet the demands from sportsmen and organizations for more fish, game and patrol service.

The article then proceeds to state that Oregon is in the same position, that present funds are not available to carry on

SECOND EXECUTIVE ORDER

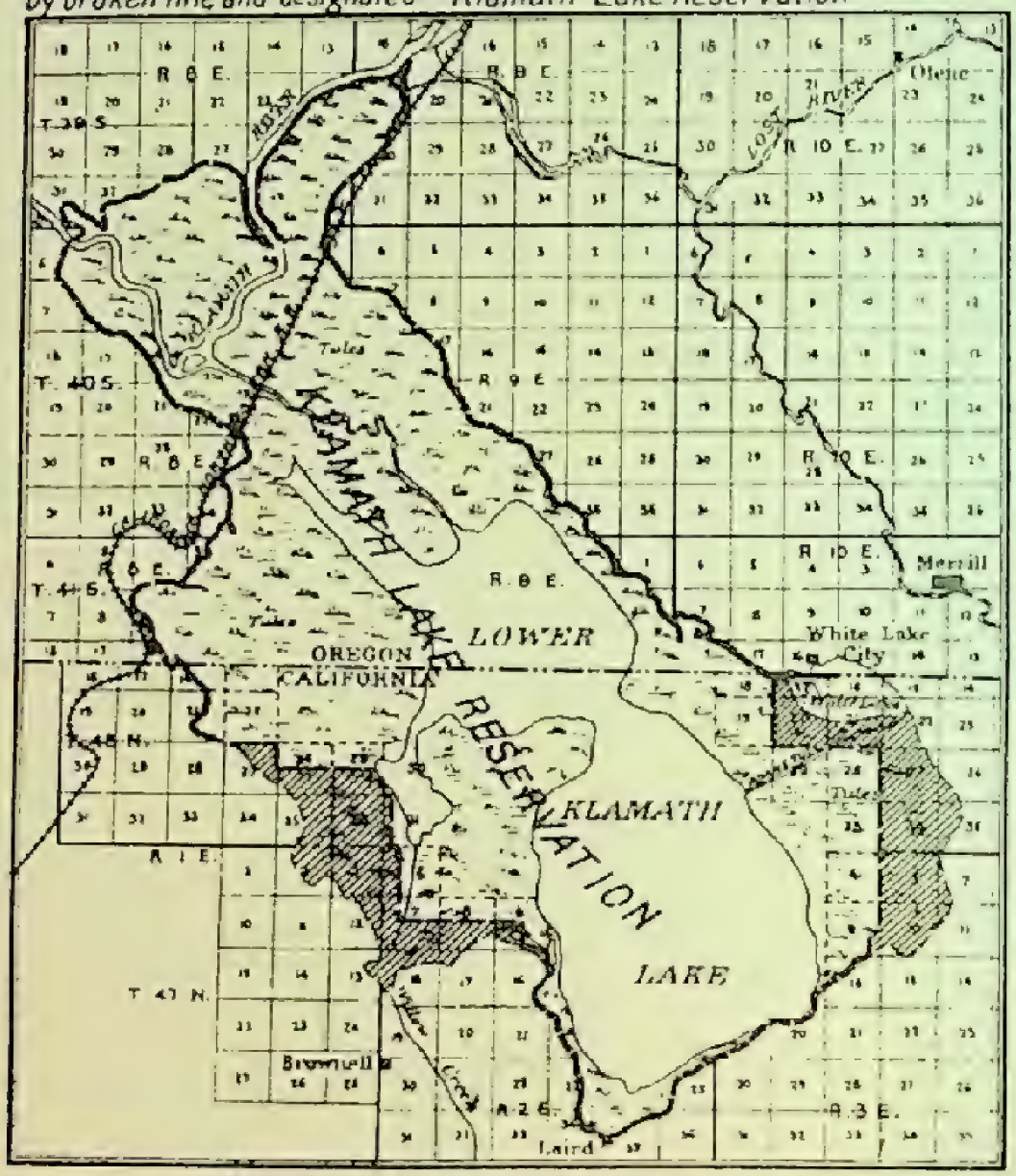
May 14, 1915

KLAMATH LAKE RESERVATION

For Protection of Native Birds

OREGON AND CALIFORNIA

Embracing all islands in Lower Klamath Lake and all Marsh and Swamp Lands in Tps 39, 40 and 41 S. Rgs 8 and 9, and Tp. 41 S. R. 10 all East of Willamette Mer. Ore. and in Tps. 47 and 48 N. Rgs. 1, 2 and 3 East of Mt Diablo Mer. Cal. segregated by broken line and designated "Klamath Lake Reservation"



DEPARTMENT OF THE INTERIOR
GENERAL LAND OFFICE
Clay Tallman, Commissioner
Area eliminated

Fig. 35. Map showing Lower Klamath Lake Bird Reservation as it was before the lake was drained. Courtesy Bureau of Biological Survey.

present operations, without an increase. Yet Oregon more than doubled her license fees several years ago.

These two large western states must awake to a realization of the fact that if these demands are to be met, those who wish to fish and hunt must pay for this privilege in proportion as they, and the rest of the taxpayers pay for good roads, gasoline and many other enjoyments of life.

An increase in hunting and angling licenses has been met cheerfully by the sportsmen themselves as shown by the large vote given the increase by both senate and house during the last legislature

THE WHITE PINE BLISTER RUST.

Because animal life is so dependent on plant life, we are calling attention to the danger which threatens all five-leaved pines (which, of course, include the famous sugar pine), due to a serious disease known as the white pine blister rust. Most of the white pines of the eastern United States have been destroyed, owing to this introduced pest, and in spite of quarantine measures, the disease has spread to western Canada, and now has been found over the line in the state of Washington.

All states are cooperating in the control of this dangerous disease. The State Department of Agriculture will keep a crew of three men employed during the coming summer in the destruction of plantings of black currant, for it is upon this plant that the spores of the rust thrive. The only feasible method of combating the disease has been through the destruction of the black currant as a host plant. Last year in this state 278 plantings of black currant were destroyed in the northern tier of counties. Experience has shown that the destruction of the currant, the most active agent concerned in the long distance spread and establishment of the disease, is a useful means of control.

SOME FARM WORKERS STILL COME CHEAP.

Now, in the lee fringe of any Northern grove or orchard, you are likely to come across this humdrum firm: Woodpecker, Chickadee, Nuthatch & Co., General Contractors for Good Riddance of Bad Bugs, Borers Extracted While You Sit by the Stove, Cankerworm and Plant-Lice Eggs a Specialty, Scale Removed, Terms, one chunk of suet in advance of sleety weather.

The black-and-white senior partner is sparrow size. He attends to borers. The rest are about as big as your Boy Scout's thumb. Chickadees half the time hang upside down, de-bugging twigs; they'll tell you in two sweet whistled notes that winter's not so dismal. Our Mr. Nuthatch scrattles over tree boles like a crab, sounds like the last late tooter of election night in elfland, and cleans rough bark with a combination awl and pair of tweezers. The Co. are a ceaseless flitting of elusive lisping atoms—kinglets, whose jeweled crowns you may not see—and a mousy little party who keeps to himself and creeps with a crooked needle.

Nobody knows exactly what the firm is worth to man. The only way to find out would be to put it out of business. Each bird, for his lifetime, has been appraised at fifty cents in bugs—but what about the progeny of the bugs? Ask your friend the gardener how fast green aphis multiply. Then ask your butcher for suet, and tie it up so cats can't reach it.—*Colliers*, Feb. 7, 1925.

BIRD SLAUGHTER IN ITALY.

To an observer who lived or traveled during spring or fall in Italy, wholesale bird slaughter is known to be an inseparable attribute to that otherwise so beautiful country. In the market places, in towns and cities, thousands of small birds are being offered for sale, neatly packed in little cases, stacks of which are in evidence. He will understand why there is next to no bird life in Italy, and how big a toll is taken from the migrants coming from north and south. A professional averages 2000 birds a day at Lake Como. Eight millions of quail arrived in one day at Marseilles from Brindisi and Messina. In Rome were marketed in one single day 20,000 quail. Fancelli figured that 250 millions (small) birds are being killed in Italy annually for food. Why these enormous numbers? Because Italy has no bird protection laws whatsoever, never had any, and because every third Italian carries a gun and may fire away at anything on the wing, from the smallest "Goldhähnchen" to a bird of prey.

A number of methods and appliances are being used. The "hunter" proceeds to an open field with a screech owl fastened to a pole shod with a pike which he sticks into the ground and shoots the birds attracted by the owl. Bird lime fastened to long poles which are shoved into the crowns of border trees, and the birds attracted by blinded hidden songsters is a common one. Record numbers, however, are achieved by means of artificial arbors resembling small groves built skilfully and with consummate

cunning, in which netting has been stretched. A masked hut hides the hunter. Blinded song birds in cages are placed in front and inside the grove, which were kept during the summer in cool cellars so that they will sing their sweet spring melodies in the fall. The hunter concealed in the hut emits shrill whistles and sharp noises frightening the birds to hide in the green cover of the grove where they get caught in the netting.

Although much writing and protesting has been done there seems to be no prospect of passing proper laws (to forbid this shameful practice). A revolt might be expected against such a law forbidding the centuries-old practice and point of view.—Dr. G. Kniesche, Director of the Zoological Park at City of Halle, Saxony.

THE REASON FOR GAME LAWS.

American people in Virginia and every other state, and in Canada, are an intelligent people. They have hearts and consciences, and when it is explained to them that game and fish laws are not bottomed from the premises to make it hard to hunt or fish, but to make hunting and fishing more enjoyable for everybody: why closed seasons are necessary during the breeding seasons; how bag limits prevented some game hog from taking more than a decent number, thus leaving some for the persons who follow; the reason for nonsale of game laws, and the reasons underlying any other restrictive laws—they soon become enthusiastic supporters of these laws.—*From Proceedings of the 18th Convention of the International Association of Game, Fish and Conservation Commissioners*, Sept. 8-9, 1924.

EUROPEAN HARE ON INCREASE IN EASTERN STATES.

According to a bulletin of the Bureau of Biological Survey, European hares were introduced into America solely as game animals for sport in coursing. They were at first liberated in New York state in a game preserve but were eventually turned loose in the open, as the preserve proved unsuited for coursing, even had the 9-mile fence that was erected been capable of retaining the animals.

There appear to have been five or more successful importations of these hares into America. Probably the most successful, from the standpoint of the subsequent rate of spread and increase, took place about 1893 at Millbrook, Dutchess County, N. Y. In that year a wealthy resident brought in several hundred from Hungary through a New York importing company, under state permit. This importation was the first of a number of his shipments, some of which consisted of 500 animals each, made at intervals of four or five years, the last being in 1910 or 1911. The number of hares introduced was increased by a smaller number imported and liberated on a neighboring estate. The high mortality during transportation made the expense of introduction very great, amounting to about $10 a head.

An earlier importation seems to have been made at Jobstown, N. J., in 1888, but without the impetus of numbers given at Millbrook, N. Y. This importation is reported to have consisted of the brown hare from England (Lepus europæus occidentalis de Winton). An importation is also reported at Bethelehem, Pa., and another at White Plains, N. Y. Information is lacking concerning the source of the hares liberated at these places. An account of the spread of European hares in Ontario, Canada, after being introduced on an estate near Brantford, Ont., has also been received.

During the 30 or more years that have elapsed since the European hare first appeared in this country, the increase and spread has been slow but steady. The present range might be roughly described as extending from southern Vermont to central New Jersey and eastward 20 or 30 miles into Connecticut and Massachusetts, and to a limited extent westward across the Hudson and Delaware rivers into extreme eastern Pennsylvania. Reports that are considered reliable have been used in mapping this distribution, but in some cases specimens are not available.

EASTERN DIVISION OF ANGELES FOREST BECOMES SAN BERNARDINO NATIONAL FOREST.

Secretary of Agriculture Jardine has approved, subject to presidential assent and proclamation, the division of the present Angeles National Forest into two units and the creation out of the eastern or San Bernardino division, of a new federal forest to be known as the San Bernardino National Forest, according to report from the California district headquarters of the United States Forest Service in San Francisco.

This action, states District Forester Paul G. Redington, is in line with the findings and recommendations of the Board of Fire Review which last November made a detailed investigation of the forest protection problems in the government forests of southern California. Better administration and fire protection are the main purposes of this new adjustment of national forest areas which comprise

one of the most intensively used mountain recreation regions in the United States.

The Lytle Creek drainage will be the boundary between the new San Bernardino National Forest and the Angeles National Forest. The Saugus district of the Santa Barbara National Forest has also been added to the Angeles so that practically all federal forest lands in Los Angeles County will be under the jurisdiction of one U. S. Forest Service officer.

BIG-HORN MOUNTAIN SHEEP MAY AGAIN FREQUENT THE WEST.

"Can you tell me where I can secure two buck mountain sheep and three ewes for extensive ranges in this state which were once occupied by large numbers of big-horn?" Such inquiries are quite commonly addressed to the Biological Survey of the United States Department of Agriculture. The only answer that can be given, says Dr. E. W. Nelson, Chief of the Bureau, is that there is no place in the United States at present where mountain sheep can be secured either for exhibition or for breeding purposes. Several shipments of big-horn have come into the United States recently as a result of the courtesy of the Canadian Government. These animals—eight ewes and four bucks—were captured in one of the Canadian parks, shipped into Montana, and turned loose in 1922 on the Montana National Bison Range. On this 18,000-acre game refuge in the northwestern part of the state they have bred twice, and the flock now numbers 28.

As far as now known, the breeding of mountain sheep is similar to that of domestic sheep, with which 75 and 80 per cent lamb crops are not unusual. The Biological Survey, therefore, confidently looks forward to the time when the mountain sheep on the Montana Bison Range will number 500—say 450 ewes and 50 bucks. With such a flock, allowing a wide margin for losses, there should be 350 or more available each year for shipment from the range to stock suitable areas throughout the country.

One shipment of mountain sheep recently received in this country from the Canadian Government was placed on the Custer State Park and Game Refuge in the Black Hills of South Dakota. The six ewes each gave birth to a lamb the year they were received. One animal, injured in shipment, died during the summer, but at last reports the others were doing remarkably well.

There is an enormous acreage of good mountain sheep country in the western United States, and there is no finer big game animal for such areas than the big-horn.

FACTS OF CURRENT INTEREST.

In spite of the series of dry seasons, trout fishing has been surprisingly good in streams that were practically dry last August. Although many fish died due to low water yet apparently many survived the period of stress.

Plans for the new game farm at Folsom are to continue in spite of the failure of the increase in licenses.

The sixth season of the Yosemite Nature Guide Service started, and, partly supported by the educational department of the Fish and Game Commission, is in full swing with an augmented program. An unexcelled opportunity to teach conservation to thousands of summer vacationists is made possible by this educational project which has now spread to all the national parks.

The City of Watsonville has recently voted to build a new outlet sewer, which will clean up the Pajaro River, the pollution of which by sewerage has caused the death of untold numbers of spawning steelhead trout.

Plans are being made for a Striped Bass Number of California Fish and Game. Contributions are solicited.

At the request of the United States Bureau of Fisheries, Mr. N. B. Scofield, in charge of the Department of Commercial Fisheries, is studying the fisheries of the Atlantic Coast after having attended some important conferences in Washington.

A recent Supreme Court decision relative to the use of sardines in reduction plants was favorable to the contentions of the Commission and was a reversal of the findings of the lower courts.

Mr. George Coleman, who has been carrying on some important surveys of lakes and streams in the state, looking toward a better knowledge of the food of trout and the conditions necessary for maximum production, has just finished a report on the work done at Clear Lake, Lake County, during the past winter.

Mr. Coleman has now been assigned to investigations on the Klamath River. Special emphasis will be placed on the kinds of insects and crustaceans utilized as food by Klamath trout.

After a period of several years, with no regular federal game warden stationed in the state to help enforce federal game laws, Mr. George Tonkin has been appointed for the district of California with headquarters at Sacramento.

Deputy W. B. Sellmer has been highly commended for the arrest of three commercial fishermen of San Francisco who were using a small mesh net for the purpose of catching striped bass. The fishermen plead guilty and were fined $300 by Judge De la Montanya at San Rafael.

HATCHERY NOTES.

W. H. Shebley, Editor.

SPAWNING OPERATIONS ON THE KLAMATH.

Extremely high water hindered spawning operations on the Klamath River. In spite of the handicap, a splendid take was secured and the new stations proved satisfactory.

CALIFORNIA PURCHASES RAINBOW EGGS.

California has difficulty in securing sufficient eggs for hatchery operation. Some eastern states, however, appear to have a surplus. As a result, California has purchased from the state of Michigan 2,000,000 rainbow trout eggs. In this transaction we have the usual reversed. In most instances, California has furnished the depleted streams of the eastern United States with fish which originally came from those streams. In this instance, California is to receive back a fish native to the waters of California and originally furnished eastern states.

NEW STATION YIELDS MORE THAN MILLION EGGS.

The new spawning station for black-spotted trout on Rush Lake netted 1,205,000 eggs. Over 1200 females and 800 males were trapped at this station. After this station was closed, attempts were made to secure additional eggs at Saddle Bag Lake.

CULTURE OF GOLDEN TROUT CONTINUED.

Early in the spring spawn takers were sent to Cottonwood Lakes to secure eggs of the golden trout for use in the Mount Whitney hatchery. Conditions were favorable and a splendid take of eggs was secured.

DISEASE TAKES EEL RIVER TROUT.

As a rule the greatest loss in fish life is noticeable during low water. However, there are sporatic instances when disease seems to be prevalent at times of abundant water supply. Considerable difficulty was experienced this spring in securing a suitable take of eggs from the large steelhead which run in the South Eel River. At the station at Snow Mountain only 712,000 eggs were secured, when a take of over a million was anticipated. Hundreds of fine large fish were found dead and dying below the spawning station. Apparently death was due to a bacillus well known to hatchery men.

COMMERCIAL FISHERY NOTES.

N. B. Scofield, Editor.

RECORD RUN OF SHAD.

News of the heavy increase in the shad run in the Sacramento and San Joaquin rivers comes from Pittsburg, the great shipping center for shad. Fishermen report the heaviest run in fifteen years. California fishermen have increased their average express shipments to the New York market from two to three carloads a day.

The protection given shad is bearing good fruit. The shad industry is capable of growth and a market within the state should be built up. At present nearly the whole catch is shipped to eastern states where the shad is really appreciated.

CALIFORNIA'S FISHERY PRODUCTS IN 1923.

In 1923 the catch of fish taken in the waters of California amounted to 230,830,942 pounds, an increase of 61,861,209 pounds, or 37 per cent, over the catch of 1922. The species taken in largest quantities were pilchard, 159,197,006 pounds; albacore and tuna, 16,562,351 pounds; flounders, 10,485,431 pounds; barracuda, 5,135,824 pounds; bonito or skipjack, 5,057,848 pounds; salmon, 7,090,260 pounds; rockfishes, 4,932,350 pounds; mackerel, 3,553,954 pounds; yellowtail, 2,968,596 pounds; white sea bass or squeteaque, 1,782,008 pounds; shad, 1,258,383 pounds; crabs, 1,075,800 pounds; shrimp, 1,113,358 pounds; abalones, 1,555,134 pounds; and squid, 1,176,065 pounds.

The imports of fresh fish from Mexico in 1923 amounted to 23,956,962 pounds, an increase of 11,810,896 pounds, or 97 per cent, as compared with 1922. The principal species imported during the year were albacore and tuna, 10,752,864 pounds; bonito or skipjack, 7,519,191 pounds; barracuda, 2,064,751 pounds, yellowtail, 1,011,015 pounds; flounders, 883,263 pounds; white sea bass or squeteague, 591,877 pounds; and sea crawfish

or spiny lobster, 708,477 pounds. These products are caught by fishermen having their home ports in California and fishing in Mexican waters a portion of the year. —Bureau of Fisheries Document 976. pp. 185-186.

SOME FIGURES ON THE MONTEREY FISHERIES.

$1,452,033 00	capital invested in plants.
240,000 00	capital invested in sardine boats and gear.
$1,692,033 00	total investment in sardine fisheries and plants.
33,360 00	paid for squid for drying.
581,085 00	paid for sardines for canning and reduction.
458,948 00	sardine cannery and reduction plant yearly pay roll for 1924.
$1,071,393 00	total pay roll for labor and fish for Monterey canning industry in 1924.
$3,375,095 00	value of Monterey canning industry product for 1924.
58,000	tons sardines caught.
2,094	tons, total squid caught.

—P. H. Oyer.

MEXICO INTERESTED IN FISHERIES CONSERVATION.

Dr. Jose G. Parres, subsecretary of agriculture and development in the cabinet of President Calles, and now on a visit to Los Angeles, is anxious to have uniform legislation in Mexico and the United States to protect the fisheries in Mexican waters off the coast of Lower California which are tributary to Los Angeles and San Diego and which are in danger of becoming hopelessly diminished. He points out that at present if a fisherman can prove that fish caught out of season came from Mexican waters the American authorities have no power to confiscate it, and as a result of such legislation, over 50,000,000 pounds of fish from Mexican waters were consumed in the local market last year. He states that the passing of uniform fish and game laws in both countries and jointly enforced is the only way in which this problem can be solved.

DEPARTMENT CHIEF INVESTIGATES EASTERN FISHERIES.

In recognition of his accomplishments in California, Mr. Norman B. Scofield, in charge of the Department of Commercial Fisheries of the Fish and Game Commission, was invited to go to Washington, D. C., to confer with the United States Bureau of Fisheries in regard to a number of problems of conservation and fishery development. The U. S. Bureau of Fisheries realizes that California has taken the lead in the care of its commercial fisheries and that it has placed its fisheries conservation work upon a firm scientific foundation. It was for the purpose of advising the bureau in its policies in relation to its fisheries conservation in the separate states and in its encouragement of the states of the Atlantic coast to follow along the lines pursued in California, that Mr. Scofield was called east.

Mr. Scofield spent the entire month of May visiting the principal fishing centers along the Atlantic coast, including an inspection of the sardine canning industry at Eastport, Maine; the pearl button industry in the middle west and the bureau's laboratory at Fairport, Iowa.

As a member of the Scientific Advisory Board of the International Halibut Treaty Commission, Mr. Scofield conferred with members of this commission and attended a meeting of the International Committee on Fisheries Investigations in New York city. In Washington, D. C., he was called into consultation with Dr. Albert L. Barrows, vice chairman, Division of States Relations of the National Research Council, who is very much interested in the fisheries investigations of the California Fish and Game Commission.

ABALONES HAVE SUFFICIENT PROTECTION.

As questions concerning the protection of abalones are repeatedly being asked of the Fish and Game Commission, we are reprinting the following statement issued by Dr. Harold Heath of Stanford University in the "Monterey American" on March 15, 1917, and in the "Monterey Cypress" on March 16, 1917:

THE ABALONE QUESTION.

By Dr. Heath, Stanford University.

To Whom It May Concern: I wish to make a few statements regarding the red abalones that occur in the fifth fish and game district.

The red abalone extend in such an abundant quantity along the coast of Monterey and San Luis Obispo counties, that it would be impossible to materially reduce their number, as they live in water beyond the depth to which a hunter can go; and their habits and methods of propagation are such that the spawn would immediately repopulate a district if it could be fished out, which, however, is impossible, as the law protects abalones under nineteen inches in circumference. An abalone of this size, nineteen inches, has had three or four years of reproduction. The eggs measure about one one-hundredth of an inch in diameter, and

about two million eggs are liberated each year from every large female abalone. An abalone recently examined, measuring eighteen and one-quarter inches in circumference, contained 1,303,128 eggs. The size of shells taken show that most of them have had six or seven years of reproductive activity before they pass the legal limits of protection. This means that each abalone has deposited from one to twelve million eggs. The spawning season for red abalone is between February 15th and April 1st. The spawn when liberated rise to the surface of the water and are carried by wind and tide miles in extent, until fertilized. After the first stages of development the eggs sink and become attached to seaweed, where the young abalones start in life. They remain practically in the same place during life, and consequently there are millions of abalones in water too deep for diving, and under rocks which are inaccessible. About half of the ocean bed is covered with huge rocks between which and under which a diver can not go.

The life of the abalone is dependent principally upon the amount of seaweed, and as this is practically inexhaustible, there is a very remote possibility indeed that the shell fish will ever become extinct. For hundreds of years abalone, the pearl oyster and other like animals of commercial value have been collected in various parts of the world and the industry goes on today. At the request of the Fish and Game Commission, I made some years ago, a study of abalone fisheries in the neighborhood of Monterey Bay, California, at which time the above facts were determined.

TEST OIL POLLUTION ACT OF 1924.

On December 31, 1924, a telephone message to this office advised that the steamer *Columbia* laying at Pier 46 was pumping oil into San Francisco Bay. Deputy M. S. Clark, assisted by S. H. Dado of the Department of Commercial Fisheries, found the *Columbia* discharging a three or four inch stream of heavy black oil into the water. A jar was lowered over the side of the boat and a sample of the oil taken for evidence and the chief engineer was notified to stop the pumps.

A complaint was sworn to in the police court against Captain A. E. Judson and the case came up before Judge Jos. M. Golden on January 7, 1925. The case was dismissed on the plea of Captain Judson that he did not know oil was being pumped into the bay. The violation was then brought to the attention of the United States district attorney and Captain Judson, as well as Chief Engineer J. A. Fortune, were arrested on March 12th for violation of the Oil Pollution Act of 1924. The case was called before Judge A. F. St. Sure on Saturday, May 23d, and Chief Engineer Fortune pleaded guilty and was fined $500 by the court.

This was the first arrest made in California under the Oil Pollution Act of 1924.—S. H. Dado.

OLD WHALER PASSES.

It is with sincere regret we report the passing of an old friend and employee of the Fish and Game Commission. Captain Albert Noyes Buell, born in Westerly, Rhode Island, in 1841, died at Bolinas, California, on April 6, 1925.

Captain Buell came to California in 1861 and engaged in the whaling industry making several cruises to the South Seas and the Arctic region during which time he wrote a most interesting log of his observations of the whales of the Pacific Ocean. In 1890 he became a partner in the firm of Thomas & Buell, operating a planing mill at Stockton. Being an ardent fisherman and a keen observer, he became an authority upon general fishing conditions of the delta region and acted in an advisory capacity to the Fish and Game Commission, and for a number of years was employed as a special deputy. At Bolinas, Captain Buell conducted a fishing and boating resort, and until the time of his death at the age of 84, he retained his interest in the fisheries work of the Fish and Game Commission and was a frequent visitor at the San Francisco office. He is mourned by a host of friends among the sportsmen and commercial fishermen of the state.

CONSERVATION IN OTHER STATES.

OREGON ADDS TO GAME REFUGES.

The last session of the Oregon legislature added approximately one and one-half million acres to the area already set aside as game refuges. Another step forward is also in evidence in the broad powers delegated to the game commission relative to regulation of seasons and bag limits.

MINNESOTA NEEDS 144 FIELD MEN.

"A minimum of 200 all-year-round salaried wardens in the eighty-seven counties of this state would not be too large a number of men to properly take care of the natural resources of the state in the line of fish, game and fur-bearing animals," the commissioner set forth in explaining his budget estimate, "and I believe I am justified in asking for a total of 126 wardens, including the chief warden, and exclusive of eighteen game refuge patrolmen, or a total of 144 men in the field twelve months of the year.

"The game refuge patrolmen and the assistant patrolmen are on duty in the

Superior State Game Refuge located in and adjacent to the Superior National Forest, the Pine County Game Refuge, Itasca County Game Refuge and Itasca State Park in Hubbard County. The salaries of all of these men thus far have been paid out of the contingent and game and fish funds."—*Fins, Feathers and Fur*, official bulletin of the Minnesota Game and Fish Department, December, 1924, p. 252.

PENNSYLVANIA'S GAME REFUGES.

Results obtained through the game refuge policy instituted by Pennsylvania are so evident and so uniformly successful as to demonstrate beyond question the value of this system. It is no longer an experiment. The steady increase in the supply of large and small game in the refuges and on the large public hunting grounds surrounding them, has been remarkable. Bear and elk have increased greatly, while the large northern deer imported from other states have thrived and multiplied rapidly, so that sections where deer were formerly plentiful but had been exterminated, are again populated with these beautiful and valuable creatures of the wilds.—Pennsylvania Board of Game Commissioners.

MORE HELP FOR THE ANTELOPE IN SOUTH DAKOTA.

Two bills were passed affecting game in South Dakota. The antelope refuge bill (Public 248, S. 2761), which was approved June 7, 1924, sets aside an area of about 25,000 acres adjacent to the eastern division of the Sioux National Forest, to be fenced by the state and held by it so long as it is maintained as an antelope refuge. Some bands of antelope already inhabit this area and it is planned to inclose them with a game-proof fence and use them to build up a large herd.

Another bill (Public 246, S. 2699) approved June 7, 1924, adds 30,000 acres to the Custer Park Game Sanctuary in South Dakota. The Custer Park Game Sanctuary, which was established by Senator Norbeck while he was governor of the state, has a variety of big game within its boundaries, including buffalo, elk, mountain sheep and deer. The new addition will permit an increase of the numbers of at least some of these animals, and will provide an opportunity for the establishment of an antelope herd.—*National Parks Bulletin*, article, Congress Advances Wild Life Conservation.

UTAH PROHIBITS USE OF SALMON EGGS.

Utah at the last session of her legislature revised her game laws. Among the changes is one that prohibits the sale or use of salmon eggs or their imitations for game fishing. As might be imagined, there was a bitter fight over this provision. The law sets the date as July 15th so that one month will be given fishermen and dealers to rid themselves of any stock they may have on hand.

Another measure which was bitterly fought was one which provided for the wearing of a red cap while hunting.

The recodification was largely drafted and supported by sportsmen.

ARKANSAS BEGINS EDUCATIONAL CAMPAIGN.

In Arkansas a good portion of the summer was spent preparing an educational moving picture of both game and fish and the plan is to have the right man continually on the road exhibiting it, in conjunction with suggestions for conservation, and the need of assistance, or organizing sportsmen's clubs and a state organization of sportsmen. Thus it is hoped to create the sentiment to back up properly the work of conservation. Sentiment is needed to secure proper legislation.

GAME LAWS BY REFERENDUM.

Arizona has the doubtful distinction of having a game law code adopted by referendum vote of the people. The fact that it was so adopted precludes its amendment or repeal by the legislature of the state. Game legislation, being a progressive rather than an exact science, game laws must perforce be subjected to frequent changes. Consequently Arizona finds herself with an antiquated game code on her hands, and has accordingly decided to submit the repeal thereof to the people at the coming general election in order to make it possible for the state legislature to enact an adequate, up-to-date code of game laws.—Bull. Amer. Game Protective Asso., April, 1925, p. 14.

IDAHO PLANS BROOD PONDS FOR FISH.

According to the last biennial report of the Idaho fish and game warden, plans are on foot to establish brood ponds as the basis of supply of eggs for the state hatcheries. This state, like California, has found it difficult to reach certain areas at the time when fish are spawning. Furthermore, unfavorable weather and water conditions frequently interfere

with the collection of eggs from wild fish. Although wild eggs may be preferable, yet a reserve supply obtainable from brood fish is very important when a shortage occurs.

The report also states that a bulletin is being prepared descriptive of all the fishes of the state in order to help anglers identify the various native and introduced species of the state.

MINNESOTA DEMANDS INCREASE OF WARDEN FORCE.

Minnesota, like California, has felt the need of better law enforcement. The budget prepared by the Commissioner of the State Game and Fish Department calls for a 320 per cent increase in number of patrolmen in the field. At present but 46 men are employed, whereas it is estimated that a minimum of 144 should be in the field in order to check up on licenses and apprehending violators. It is also hoped that the appropriation will be sufficient to increase the salaries of the field men so that the most efficient and desirable personnel may be employed.

PREDATORY ANIMAL BOUNTIES IN PENNSYLVANIA.

At the eighteenth convention of the International Association of Game, Fish and Conservation Commissioners, Mr. Seth E. Gordon, executive secretary of the Pennsylvania Board of Game Commissioners, read a paper entitled "Developments in Vermin Control." Therein it was pointed out that from the beginning of the hunting license system in Pennsylvania to the present time a total of $1,080,228.50 has been paid out on bounties for predatory birds and mammals.

As a defense to this vast expenditure he has this to say:

"You may well ask has this large expenditure of money been worth while, and to whom did this vast sum go. The large majority of the claims come from rural residents, mostly the older boys on the farms who spend considerable time each winter trapping. While most sportsmen during the hunting season kill game destroyers if convenient, they do not follow vermin to the exclusion or neglect of game hunting. When through hunting for the season they return to their homes and busy themselves with their daily tasks, leaving the remnant of game to battle unaided through the long winter months, with the elements and destroyers all against them.

The trapper interested in good furs alone does not bother much with special traps for wildcats and weasels unless paid for his extra trouble, but the country lad, having in mind both the bounty and the value of the furs taken, also the protection to domestic poultry, makes a special effort to destroy vermin if he is shown how and where to trap.

As to whether it has been worth while, stop to consider what this horde of destroyers and their natural increase would have done to the game in Pennsylvania. The fact that game has held its own, in most instances actually increased, regardless of the ever-increasing army of hunters, is sufficient proof of the value of vermin control work.

At first one trapping instructor was employed who got all of the refuge keepers trapping the maximum amount of vermin possible; also taught them suitable methods for demonstrating to others in their surrounding territory how to trap successfully. The District Game Protectors were given the same instructions, and then followed a well advertised trip of instruction into sections of the state where vermin conditions were in need of attention."

UTAH BARS SALMON EGGS AS BAIT.

The recent Utah legislature passed three laws which are of especial interest to the outdoorsman. One of these was the revision of the state fish and game laws. This appears to be an almost necessary biennial event. This year the changes made were not great but there was a bitter fight over the provision which finally was retained in the law, which prohibits the sale or use of salmon eggs or their imitations, for game fishing. Dealers are given until July 15th to get rid of their stocks. It is asserted that the retailers had very few on hand, and that the wholesalers can readily return their stock to the packers, since there was a light pack last season, and the market for this class of goods is such that there will be no trouble in disposing of them elsewhere.—*Western Sportologue*, April, 1925, p. 22.

LOUISIANA'S MUSKRAT CROP.

Louisianians earn more than one million dollars a year in trapping the "muskrat," from 3,000,000 to 4,000,000 of which are caught each year.

The muskrat is the most important fur-bearing animal in Louisiana, and this crop is nearly all sold by the trappers to their merchants and dealers who in turn sell and ship the furs out of the state in large lots. The trapping season opens November 15th and closes February 15th, and some of the trappers average from $5,000 to $8,000 for their catch in this short period.

The muskrat leads an equatic life and is remarkable for its breeding propensities, the average being four litters a year, with four to six rats to a litter.—Adapted from *Conservation News*, Mar. 1924.

IDAHO TO PLANT MACKINAW TROUT.

In the tenth biennial report of the fish and game warden of the state of Idaho,

it is stated that plans are being worked out for a further stocking of some of the larger lakes.

It is expected that a consignment of 25,000 eggs of the eastern landlocked salmon will be received from Maine, and investigation is being made of several places where it is proposed to collect eggs of the steelhead trout. Retaining ponds will be constructed near Lake Payette and Priest Lake where these fish will be held and grown to yearling sizes and then planted in these lakes.

A consignment of 100,000 Mackinaw trout eggs are to be shipped from Lake Superior and will be hatched and reared to five and six-inch fingerlings and then planted in Coeur d'Alene and Pend d'Orielle lakes, while an exchange has been made with the New Hampshire Fish and Game Commission for eggs of the Sunapee saibling or golden trout which will be planted in lakes of the Sawtooth country.

This should be good news to the fishermen who congregate in great numbers at these lakes.

LIFE HISTORY NOTES.

THE CALIFORNIA GRIZZLY.

Even though that monarch of the forest, the grizzly bear, the animal for which our state is named, is considered extinct in California, it is not surprising that there have been a few sporadic instances of occurrence. It was supposed that the last California grizzly died in Golden Gate Park a number of years ago. Interest in finding other definite records for the state has been stimulated due to the issuance of a publicity item from Sequoia National Park, stating that a large grizzly had been observed in and near the giant forest.

Now comes authentication by Dr. C. Hart Merriam of the killing of a female by J. B. Agnew at Horse Corral Meadows, Tulare County, August, 1922. Identification was made certain by a tooth, even though the skin was not available.

Another authentic record is of a female killed in Tujunga Canyon, Los Angeles County, by Cornelius B. Johnson, in October, 1916. The annual report of the committee for conservation of wild animal life of the California Academy of Sciences gives these additional dates:

1895—Last grizzly in Yosemite National Park;

1897—Male, Tujunga Canyon, Los Angeles County;

1908—Two specimens Trabuco Canyon, Orange County.

The actual records, therefore, are rather scattering, as follows:

Beginning with the capture of "Monarch" about 1886: 1895, 1897, 1908, 1916, 1922.

In that no black bears have yet been taken in southern California, any evidence of bears from this region should be immediately reported to the State Museum or the California Academy of Sciences. It would be still more to the point if a real live California grizzly could be reported for the state. If there be a single one left, it should be considered the nucleus of a breeding stock to perpetuate this famous species as a part of the fauna of the grizzly bear state.

A FEW ROOSEVELT ELK STILL EXIST IN DEL NORTE COUNTY.

The remaining band of any size of Roosevelt elk occupy a strip twenty miles long by four miles wide near the ocean just north and west of Orick, Del Norte County, California.

The area lies between the county road and the ocean.

Public sentiment of residents is a large factor in their safety. Six elk were reported by a farmer near Iquay on Jaeger Creek this past winter.—Earl Barnes, Eureka, California.

DEL NORTE COUNTY ELK.

Indications are that only a few elk exist in Del Norte County, that they are widely scattered and do not seem to inhabit any one place continuously as they do near Orick, Humboldt County. Last fall, forest rangers saw a bull elk at Island Lake situated in the high Siskiyous, and three citizens reported seeing elk in different localities in the vicinity of Crescent City within the last year.

Apparently, this scarcity of elk is due to the mountain lion which preys upon the young of both the elk and the deer. Territories where deer are plentiful become suddenly deserted and it is some time before they "work back" to their favorite habitat.—H. S. Prescott, Crescent City, California.

REPORTS.

SEIZURES OF FISH AND GAME.

January, February and March, 1925.

Ducks		312
Geese		16
Wild pigeons		7
Shorebirds		13
Quail		46
Pheasants		2
Nongame birds		16
Deer meat	pounds	187
Deer hide		1
Rabbits		6
Trout	pounds	1,058
Striped bass	pounds	6,107
Whitefish		2
Smelt	pounds	10
Barracuda	pounds	1,200
Clams		924
Lobsters	pounds	734
Crabs		1,182
Abalones		2,330
Nets, seines		1
Crawfish traps		60

GAME CASES.

January, February and March, 1925.

	Number Arrests	Fines Imposed	Jail Sentences (Days)
Violations of Hunting License Act	15	$265 00	
Deer: killing, possession; closed season	17	1,360 00	125
removal of evidence of sex from hide	1	25 00	
killing, possession; does, fawns, spike bucks	4	225 00	
dogs; closed season	1	25 00	
Ducks: killing, possession; closed season	9	210 00	
Geese: killing, possession; closed season	4	115 00	
Doves: killing, possession; closed season	1	75 00	
Wild pigeons: killing, possession	6	125 00	
Shorebirds: killing, possession	3	75 00	
Quail: killing, possession; closed season	2	75 00	
Pheasants: killing, possession	3	200 00	
Rabbits: cottontail, brush: killing, possession; closed season	3	75 00	
Squirrels: killing, possession	1	25 00	
Nongame birds: killing, possession	27	930 00	
Trespass	1	25 00	
Night hunting	27	750 00	
Total	125	$4,580 00	125

FISH CASES.

January, February and March, 1925.

	Number Arrests	Fines Imposed	Jail Sentences (Days)
Violations of Angling License Act	7	$200 00	
Violations of Commercial Fishing License Act	5	60 00	
Trout: closed season	8	175 00	25
other than hook and line	9	250 00	
Striped bass: overlimit, undersized	34	1,035 00	
Catfish: sale of undersized	1	20 00	
Crabs: female	1	25 00	
undersized	14	290 00	25
Clams: overlimit, undersized	60	1,535 00	90
Abalones: overlimit, undersized, closed season	106	2,875 00	162½
Lobsters: undersized	12	450 00	
Barracuda: undersized	1	25 00	
Salt water eels; undersized	4	125 00	
Halibut: undersized	1	25 00	
Illegal night fishing	5	115 00	
Obstructing streams	8	250 00	
Nets, traps, lines: illegal possession or use	10	$50 00	100
Total	286	$8,305 00	402½

STATEMENT OF INCOME.

For the period January 1, 1925, to March 31, 1925, of the seventy-sixth fiscal year.

	Detail	Total
License sales:		
Angling	$32,718 00	
Hunting	34,569 70	
Market fisherman's	2,700 00	
Trapping	417 00	
Wholesale fish packers' and shell fish dealers'	195 00	
Game breeders'	195 00	
Fish breeders'	35 00	
Kelp	10 00	
Total license sales		$70,939 70
Other income:		
Court fines	$12,741 00	
Fish packers' tax	28,453 81	
Fish tag sales	725 00	
Game tag sales	12 96	
Sale of beaver hides	49 00	
Interest on bank deposits	413 24	
Total other income		$42,395 01
Total income		$113,334 71

STATEMENT OF EXPENDITURES.

For the Period January 1, 1925, to March 31, 1925, of the Seventy-sixth Fiscal Year.

Function	Materials and supplies	Salaries and wages	Service and expense	Property and equipment	Total
Administration:					
Commissioners			$247 01		$247 01
Executive offices	$205 25	$4,481 28	1,146 37	$86 96	5,910 86
Printing	1,656 70				1,656 70
Research and publicity	44 99	1,572 60	489 40		2,106 99
Accident and death claims			419 16		419 16
Department totals	$1,906 94	$6,053 88	$2,301 91	$86 96	$10,349 72
Commercial fisheulture and conservation:					
Superintendence	$165 28	$2,565 00	$1,011 33		$3,771 61
Inspection and patrol	1,150 70	4,266 54	727 68	$22 93	6,167 85
Research	216 29	3,723 15	506 55	505 92	4,951 91
Statistics	4 05	1,602 42	35 43		1,641 90
Propagation and distribution of salmon	1,606 01	2,741 72	212 37	215 60	4,775 70
Department totals	$3,142 33	$14,898 83	$2,523 36	$744 45	$21,308 97
Sporting fisheulture:					
Superintendence	$43 96	$2,550 00	$630 67	$18 00	$3,242 63
Special field investigation	38 61	600 00	198 61	176 10	1,013 32
Printing					
Propagation and distribution of trout	5,362 33	12,978 46	2,646 43	1,424 35	22,411 57
Department totals	$5,444 90	$16,128 46	$3,475 71	$1,618 45	$26,667 52
Patrol and law enforcement:					
Prosecutions and allowances			$212 50		$212 50
General patrol	$340 43	$36,768 50	22,350 75	$996 40	60,456 08
Department totals	$340 43	$36,768 50	$22,563 25	$996 40	$60,668 58
Fish and game conservation:					
Game bird introduction		$474 19	$627 48		$1,101 67
Game farms		264 29	16 69		280 98
Mountain lion hunting		375 00	172 84		547 84
Mountain lion bounties			1,980 00		1,980 00
State Fair exhibit					
Department totals		$1,113 48	$2,797 01		$3,910 49
License commissions			$11,440 10		$11,440 10
Tahoe camping ground					
Grand totals	$10,834 60	$74,963 15	$45,101 37	$3,446 26	$134,345 38

CALIFORNIA FRESH FISHERY PRODUCTS FOR THE MONTHS OF JANUARY, FEBRUARY AND MARCH, 1925.

Species of Fish	Del Norte, Humboldt	Mendocino, Sonoma, Lake	Marin	Solano, Yolo	Sacramento, San Joaquin	Alameda, Contra Costa	San Francisco, San Mateo	Santa Cruz	Monterey	San Luis Obispo, Santa Barbara, Ventura	Los Angeles	Orange	San Diego, Imperial	Total	Mexican, brought into California via San Pedro	Mexican, brought into California via San Diego	Total Mexican fish brought in
Albacore											12,206			12,206			
Anchovies										28,195	1,050,316		89,413	1,167,924	588,326	86,640	674,966
Barracuda								50	3,472					3,522			
Bluefish							21,192	18,285	199,126					238,603			
Bonito										1,385	1,125	11	2,303	4,824	6,630	6,177	12,807
Carp		23,268		400	19,401	11,332	1,215						255	55,871			
Catfish		81,983		153	52,255	13,276								147,667			
Chilipepper							965	40,147	6,542					47,654			
Cultus Cod	88	159					58,697	4,031	28,770			185		91,930			
Dolphin																	
Eels																	
Flounders	9,785		75	3,300		1,791	50,999	12,223	12		159	182	40	78,566			
Grayfish							97,483		20		212	26	80,556	178,297			
Greenfish																	
Hake																	
Halibut							1,634	261	1406	92,759	203,850	49,255	167,337	606,502	46,517	221,793	268,310
Hardhead					11,793	205								11,998			
Herring	1,719		833				780,920	2,125		1,110				705,716		2,800	2,800
Kingfish							300	14,787	50,615		126,497	632	3,301	196,132			
Mackerel	100							17	48,175	6,149	540,816	130,192	246,390	972,139	3,452	3,210	6,662
Marlin																	
Mullet											6,419		11,485	17,904		2,103	2,103
Perch	5,711	1,699	21,800				13,137	1,001	5,121	427	19,178	302	1,255	69,631	355	1,785	2,140
Pike				15	1,932	718								2,665			
Pompano									60		38			98		515	515
Rock Bass											9,325	3,879	21,032	34,236	298	5,573	5,871
Rockfish	30	4,583					119,209	40,734	68,567	9,986	756,681	5,175	552,941	1,557,916	320	2,810	3,130
Sablefish							81,890	132,431						214,321			
Salmon			11	4,026	10,669	9,132	156,481	9,128	339,516					528,966			
Sand dabs		8,160					430,104		1,380	20	3,501	249		443,474			
Sardines			150				69,525		12,877,268	143	130,820,015	100	14,027,859	193,795,060			
Sculpin											13,833	3,342	9,031	26,106			
Sea Bass—Black										285	5,126	13,101	12,135	30,947	1,418	16,644	18,062
Sea Bass—White		20	469							1,221	74,412	4,129	40,456	123,716	225,502	10,752	236,254
Sea Trout											1,367		102	1,469		16,333	16,333
Shad				773	3,901	11,827	1,528				285			18,314			

Shad—Buck				25,631	8,380	109,433								143,444			
Shad—Roe				20,331	6,135	106,041								132,507			
Sheepshead																	
Skates							67,570	38		148	4,077	188	4,039	9,052			
Skipjack											3,179	113	70	70,970			
Smelt	17,739	1,143	6,573			672	27,843	40	12,497	34,570	44,120	1,094	6,835	153,135	189,603	55,774	245,377
Sole		62,270				215	1,957,964	10,062	7,926	24,582	17,257	739	2,921	2,083,036	367	481	848
Splittail					5,832									5,832	1,405	2,892	4,297
Striped Bass			158	18,772	50,465	111,436	17,969							198,800			
Stingaree																	
Suckers		2,752			60	25								2,837			
Surf Fish																	
Swordfish																	
Tomcod							3,889							3,889			
Trout—Farm																	
Trout—Steelhead																	
Tuna															8,260		8,260
Tuna—Bluefin															106,275		106,275
Tuna—Yellowfin															489,546	907,798	1,397,344
Turbot		65	1,521											1,589			
Whitebait	1,227		8				341							1,576			
Whitefish										685	51,805		26,544	82,034		2,233	2,233
Yellowtail											159,533		1,447	160,980	192,790	108,627	301,417
Miscellaneous		13,878			5	4	483	50	2,521	14,765	36,582	10,682		78,970	1,977	235	2,212
Total fish	36,399	199,890	31,601	73,401	170,828	376,107	3,970,401	285,510	43,652,994	219,448	140,054,544	224,176	15,308,647	204,603,955	1,863,047	1,455,205	3,318,252
Crustaceans																	
Crabs	[1]55,008	[2]8,040	[3]936				[4]1,164,576	[7]36,600	[8]6528					[9]1,271,688			
Ecrevisse																	
Shrimps			108,572				143,081							251,653			
Spiny Lobsters										17,267	35,127	2,231	25,625	80,250	1,295	683,033	684,328
Mollusks																	
Abalones									169,710	2,798				172,508			
Clams—Cockle		35	1764											1,799			
Clams—Mixed	5,865	228	15,053						120			47		22,213			
Clams—Pismo										73,817				73,817			
Clams—Softshell		822	20,068			33,487	13,557							68,834			
Cuttlefish			90				3,609	14,519	25 202		54			43,483			
Limpets																	
Mussels							3,909		2110	43				6,062			
Oysters—Eastern			[5]28,745				[6]97,895							[10]126,640			
Oysters—Native																	
Snails																	
Squid							252		9,420		44,712		14,950	69,334			
Miscellaneous																	
Frogs																	
Terrapins																	
Turtles																	
Totals	97,272	209,024	208,638	73,401	170,828	409 594	5,397,280	336,629	43,866,084	313.373	140,134 437	226,454	15,349,222	206,702 236	1,864,342	2,138,238	4,002,580

All amounts shown in pounds unless otherwise specified. Albacore and skipjack cleaned.

[1]2292 dozen. [2]39 dozen. [3]335 dozen. [4]139660 shell oysters. [5]48,524 dozen. [6]144,978 shell oysters. [7]1,525 dozen. [8]272 dozen. [9]52,987 dozen. [10]575,638 shell oysters.

39611 8-25 7500

PATROL SERVICE.

SAN FRANCISCO DIVISION.

I. Zellerbach, Commissioner in Charge. J. S. Hunter, Assistant Executive Officer.

Phone Sutter 6100.

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Theo. M. Benson—Fortuna	L. W. Longeway—Sonora
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SACRAMENTO DIVISION.

F. M. Newbert, Commissioner in Charge.

Geo. Neale, Executive Officer.

Forum Building, Sacramento.

Phone Main 4300.

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M. J. Connell, Commissioner in Charge.

C. S. Bauder, Assistant in Charge.

Pacific Finance Building, Los Angeles.

Phone: Metropolitan, 3621.

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CALIFORNIA STATE PRINTING OFFICE
JOHN E. KING, State Printer
SACRAMENTO, 1925

1925 ABSTRACT CALIFORNIA FISH AND GAME LAWS 1926

WHITE SQUARES INDICATE OPEN SEASON — NUMBERS IN SQUARES ARE OPEN DATES

THIS ABSTRACT WILL BE VALID UNTIL 90 DAYS AFTER ADJOURNMENT OF THE 1927 LEGISLATIVE SESSION

	DISTRICTS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	BAG AND POSSESSION LIMITS, ETC.
DEER	1-1½-4½ 23-24-25-26										15			No Does, Fawns or Spike Bucks Nor Forked Horned Muledeer in Dist. 1½ No sale of Venison or Deer Skins Two Bucks per Season. See Notes 8-9-10-14-15-16
	1½									15	15			
	2-2½-3									14				
	4-4½									16	15			
Rabbits—Cottontail and Brush	ALL													15 per day. 30 per week No limit in District 4
Tree Squirrels	ALL													Closed until September 1st, 1927
Elk, Antelope, Mountain Sheep, Sea Otter, Beaver*	ALL													Killing of Elk or possession of Elk meat a felony $1,000 fine for Sea Otter
Bear, Fur Animals	ALL										15			See Notes 11-12
Ducks, Geese, Jack Snipe, Mud Hens	ALL	15												See Notes 4-14-15-16
Rail, Wood Duck, Wild Pigeon, Shore Birds (Except Jack Snipe)	ALL													
Quail—Valley, Desert and Mountain	ALL EXCEPT 1½													Valley and Desert 15 per day. 30 per week Mountain 10 per day. 20 per week
	1½													
Sage Hen	ALL								15					4 per day. 8 per week
Dove	ALL Except 4-4½-4½													15 per day. 30 per week
	4-4½-4½													
Grouse	ALL									15	14			4 per day. 8 per week
Pheasant	4½												7	6 per season
Trout (Except Golden), Whitefish	1-1½-2-3 4-4½ Lake Almanor													Bag limit for taking and possession, 25 trout or 10 pounds and one trout or one trout weighing 10 pounds or over per day. For other restrictions See Notes 19-20-24 36-37-39 40-42 On this Card
	2½		14											
	23-24-25					30								
	See Notes 25-26													
	1½ Winter													Bag limit for taking and possession, 5 trout regardless of weight per day
	2-3-10 Tule Water												15	
	2-2½-10 Spear													Bag limit for taking and possession, 1 trout per day
Golden Trout	ALL						30				1			20 per day. None under 5 inches
Black Bass, Sacramento Perch and Crappie SEE NOTE 44 FOR DISTRICT 4½	ALL													25 per day. No Black Bass under 7 ins.
	Clear Lake in Lake Co.													Clear Lake 10 per day. No sale Hook and line only
Sunfish	ALL													25 per day. Hook and line only
Striped Bass, Shad	ALL													See Note 23
Salmon	15						15							See Note 27 for other districts, limit etc.
Crabs	ALL							30				15		See Note 28
Abalones	ALL	14			16									See Note 33
Pismo Clams	17													See Note 32
Spiny Lobster	ALL										15			See Note 28

LICENSE PROVISIONS

HUNTING LICENSE — License Year July 1 to June 30

Residents, $1.00. Non-Residents, $10.00 Declarant Aliens, $10.00. Other Aliens, $25.00.

ANGLING LICENSE — License Year January 1 to December 31

Residents, $1.00. Non-Residents, $3.00. Aliens, $3.00.

No angling license required of those under 18 years of age.

TRAPPING LICENSE — License Year July 1 to June 30

Citizens, $1.00. Aliens, $2.00. Under 18 no license.